International Management Digest®

O.S.

JULY 1960
ONE DOLLAR

THE McGRAW-HILL PUBLICATION OF WORLD BUSINESS INFORMATION

Russian business plans (— and problems)

BRAZILIAN MANUFACTURERS (they have export hopes)

BRITISH CONSUMERS (they are organizing)

FRENCH CHEMICAL PRODUCERS (getting set for competition)

An American textile family (who will head the firm?)

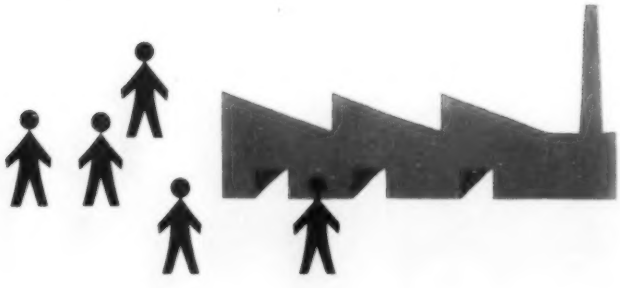
The world's rare metals (some exciting new uses)

see contents, page 6

Quality – and what is behind it

021 A1

Men and Factories



Over 73,000 people work for Daimler-Benz AG in five large factories and the depots in Germany and in their world-wide sales and service organisation. These people uphold the proud tradition of the world's oldest automobile manufacturer to offer you the best in motorcars and in customer service.

MERCEDES-BENZ

INTERNATIONAL
MANAGEMENT'S

American Letter

July 1960

A RUSH OF DEVELOPMENTS IN THE WORLD OF CURRENCIES AND EXCHANGE. For the most part, they reflect progress toward stability and convertibility, and some lessening of international inflationary pressure. It is significant that currency confidence was not appreciably shaken by the warlike talk following the summit collapse.

Note several recent changes: Japan is at last taking a first step toward convertibility: "free yen" bank accounts, convertible at will, for non-residents...The Philippines hope to free the peso with a gradual--though risky--scheme to arrive at a free market by 1964...Peru has cut away the last curbs on the sol...As for the highly-advertised "hard" ruble: Despite the Soviet plan to increase its gold content, the ruble will probably remain as inconvertible as ever.

AMONG THE MAJOR TRADING CURRENCIES: The pound sterling, the Deutschemark, the Italian lira, Swiss franc, French franc, even the U.S. dollar (for all the talk of "weakness") are harder than they have been in some time.

But there are conflicting patterns within the group: Look at the D-mark and the dollar. The D-mark's surging strength continues to embarrass Bonn, and the Germans are taking stern measures to discourage speculative funds from abroad, following the June increase in the bank rate. For their part, U.S. authorities decreed easier money last month, and lower interest rates could put the dollar under slight pressure. Sterling, just now entering its "vulnerable" season, and the French franc stand somewhere between the two--with the pound leaning more toward strength, and the franc toward weakness.

But it would be a mistake to over-emphasize these differences. The leading currencies are probably stronger in relation to each other than they have been in several years. This tends to moderate speculative rushes from one to another.

LOOKING AHEAD SIX TO TWELVE MONTHS: Experts at the International Monetary Fund are optimistic. They see for the near-term future a time of "sound money," and predict that a number of countries will move further toward full convertibility.

There are exceptions. Brazil's bloated cruzeiro will probably not receive any anti-inflation treatment before next year...Indonesian and Turkish currencies are battling severe economic and political upheavals...In Chile, reconstruction demands are certain to disturb what has been a successful effort to stabilize the peso...The flight from the Cuban peso continues unabated...There is concern about the Indian rupee, but IMF observers see signs of sounder money policies in New Delhi. (You may have noticed the slippage in the Canadian dollar vis-a-vis the U.S. No basic weakness here: Canadians are delighted to see the premium fade.)

LOOKING FURTHER AHEAD. Some difficult currency problems, affecting the entire world, may be lurking over the horizon. If there should be a severe recession in business, pressure on the dollar and the pound--the two major reserve currencies--could become overwhelming. An editorial on page 8 discusses the matter.

American Letter

LETTER FROM MEXICO: BUSTLING, MULTI-LINGUAL, PROFITABLE. Mexico City was once a private preserve of the "Gringos"--the North Americans--but now everybody is moving in, reports McGraw-Hill Mexico. In restaurants all over the city you hear business lunches in Japanese, French, Dutch, German, Italian, and--more and more --in the Slavic tongues of East Europe.

Why the cosmopolitan influx? Businessmen and investors like the excitement of the Mexican market (33-million souls, with a fast-rising per capita income); they like the sound money, the political stability that Mexico offers. And now a new trend: Businessmen have plans to serve the entire Latin American market from a Mexican base, within the framework of the new Common Market.

And the money rolls in. Big money, like the recent $72-million French credit for hydro-electric gear, the $50-million German loan (also electrical equipment), and, of course, the $100-million credit from the U.S.A.'s Prudential Insurance. All this--and more--in spite of an increasing tendency for the government to put restrictions on what foreign capital can--and cannot--do.

MANUFACTURING MAGNET: Industries like electronics, oilfield equipment, a variety of consumer goods (a boom in liquor distilling, thanks to stiff import taxes), motor vehicles. Until now, foreign auto makers--marketing 38 different brands--have stuck to import or mere assembly. But as in Brazil, the government now says: "Come with integrated production plans--or get out!"

The auto men are coming in. Ford leads off with a $50-million proposal. Mercedes-Benz says it can do anything Ford does. Ditto for General Motors. And a group of other U.S., European, Japanese manufacturers say they are ready too.

Petroleum is appealing. Pemex, the state monopoly, has let it be known that local producers of oilfield equipment will be completely protected. This encourages Europeans who would like to break the U.S.A.'s hold over the market. Meanwhile, foreign businessmen see big opportunities in Pemex's petrochemical plans.

Advertising, too: Mexico City has a fast-growing "Madison Avenue", where U.S. agencies find good business, lower costs, and a base for future Latin American marketing operations.

THE FORTUNE HUNTERS: Mexico has for years attracted names like Wenner-Gren, Patino. But now younger businessmen from Europe are arriving. A Frenchman, formerly with the House of Morgan in Paris, says: "I came because in the old country, everything has been done. In Europe, the major business activity is organizing what already exists. In Mexico, we can create new businesses."

And the "quiet ones." They shun publicity, use Mexico as the base for international speculation--tax-free. One deal involves huge purchases of some well-known U.S. mutual funds. It is tricky, depending on a complicated U.S.-Dutch treaty whereby non-Americans and non-residents of the U.S. can buy U.S. stocks and bonds held by companies in Curaçao (Dutch West Indies), who in turn sell bearer shares in Mexico.

MORE WORRY ABOUT THE UNION--MORE INTEREST ELSEWHERE. That sums up investor sentiment about Africa south of the Sahara. Harry Oppenheimer, chairman of Anglo-American Corp., tells how four large projects in the Union are in "cold storage" because foreign investors balked. Charles Engelhard, with one of the largest U.S. stakes in South Africa, puts it bluntly: No chance of any more American money on reasonable terms without new racial policies acceptable world wide.

But this distrust does not seem to spill over into other areas. Note Chase Manhattan Bank's $10-million for the Rhodesias, and its participation--with Europeans--in a Nigerian textile mill (the first major U.S. private investment there). Or International Finance Corp.'s joint venture (its first in Africa) with British and Dutch money into sugar in Tanganyika. It will open virgin land for development and--incidentally--give Africans a chance to buy shares in the enterprise.

Other private deals are brewing in Wall Street and in European centers. There's cautious optimism, even about the newly-independent Congo. Says a U.S. finance man: "We're not closing our doors to anything--anywhere--in Africa."

* * * *

WEST GERMANY IS MOVING FURTHER INTO DEVELOPMENT LENDING. At this month's meeting of the nine-nation Development Assistance Group, the Germans will unveil their new foreign aid fund. For some time, the U.S.--among others--has urged Bonn to provide more assistance for poorer nations. Also, Bonn may feel some prodding from East Germany, where a new "global" program is taking shape (IMD--June,p2).

Into West Germany's proposed fund will go $125-million from the sale of Volkswagen shares, another $125-million raised on the capital market. Interest from Marshall Plan counterpart funds will be added--$50-million every year. Thus, the Fund will total $500-million over five years. Besides financing basic projects, the money may be used to subsidize commercial loans. (In addition, West Germany will maintain a separate fund of $62-million for technical assistance loans.)

Critics of the program--and they include some Germans--do not think it goes far enough. Most of the first $250-million has already been promised (Bonn will not say to whom); and not enough will be added each year to quiet demands that Germany "open its coffers." Those coffers are bulging: Gold and foreign exchange reserves increased by $400-million in March and April alone.

NEW & NOTEWORTHY: Two elements, one spherical and the other concave, take the place of ten in a new f/0.8 optical lens designed by Prof. Shotaro Yoshida, Tohoku Univ., Sendai, Japan. The secret is in the spherical lens, a special glass containing the rare-earth lanthanum.

Tiny two-way radios, only 3 x 6 x 15 cm., from Globe Electronics (an affiliate of Textron Inc.), U.S.A., are transistorized, with a range of 1.5 km.

Artrite Resins Ltd., Camberly, England, has developed polymers that are said to mold like plastics but to have the thermal strength of ceramics. Products made from the new polymers stand up under heat of 1000 C. Possible applications: missiles, high-speed aircraft, cooking utensils.

Want a helicopter? Bensen Aircraft, Raleigh, N.C., U.S.A., has a simple, cheap one-man machine, powered by an outboard motor, that weighs just over 300 kilos.

U.S. PREPARES FOR HARD BARGAINING AT SEPTEMBER TARIFF TALKS. Washington hopes for some solid trade concessions, especially from the European Six, on such things as autos, coal, tobacco, and other manufactures. And it plans to offer concessions which include some domestically-sensitive metals and manufactures, chemicals, etc.

Though the talks--under the auspices of GATT--will take place at the peak of the U.S. election campaign, American representatives will assure participants that U.S. trade policies will not be affected. Both parties support freer trade.

On the other hand, some trade experts maintain that the U.S. offer list is "deceiving" inasmuch as Congress has limited the President's authority to offer selective concessions to 20% of existing duties. They also point out that the products the U.S.A. could import in greatest volume--non-ferrous metals, various semi-fabricated industrial items and light-industry goods--are not on the bargaining list.

Domestic business pressures may force the government to grant fewer concessions, as well as to remove some items from the offer list entirely. Woolen fabrics, coal tar products, aluminum and steel wire, bars, and other forms are a few. This will be decided after the public hearings--going on this month--in Washington. Worth noting: Despite protectionist pressure, the Tariff Commission last month tightened its definition of what constitutes injury to imports. If the ruling stands, it is a victory for liberal traders.

A QUICK REVIEW OF EXCHANGE, CREDIT, AND BUSINESS CONDITIONS

Country	Exchange Rate (units per $1, New York) 6 June, 1960		5 May, 1960	Government Reserves (gold & foreign exchange, millions) latest month	year ago	Dollars in U.S. Banks (Millions)	Conversion Delays / Collection Experience		Business Conditions
Argentina	80.00	Peso	82.75	$ 317.0	$ 161.0	$ 388.0	2 Mos.	Fair-Good	Fair-Good
Australia	* 2.23	Pound	* 2.23	1,226.0	1,157.0	114.0	None	Very Good	Good
Austria	25.31	Schilling	25.65	643.0	694.0	264.0	None	Good	Good
Belgium	49.26	Franc	50.00	1,324.0	1,357.0	146.0	None	Very Good	Good
Bolivia	12,000.00	Boliviano	12,000.00	10.1	9.9	20.8	3 Mos.	Fair-Poor	Fair-Poor
Brazil	180.00	Cruzeiro	189.00	401.0	440.0	156.0	3 Mos.	Fair-Good	Fair-Good
Canada	.9804	Dollar	.9660	1,851.0	1,942.0	2,349.0	None	Very Good	Very Good
Chile	1.05	Peso	1.05	123.3	99.6	151.5	2 Mos.	Good	Fair
Colombia	6.66	Peso	6.72	204.0	193.0	199.0	2 Mos.	Good	Good
Costa Rica	6.67	Colon	6.67	16.8	24.3	18.9	1 Mo.	Good	Good
Cuba	1.80	Peso	1.25	256.0	372.0	149.0	3 Mos.	#L/C Basis	Deteriorating
Denmark	6.80	Krone	6.80	261.0	255.0	113.7	None	Very Good	Good
Dom. Rep.	1.01	Peso	1.00	40.6	48.0	28.5	None	Very Good	Good
Ecuador	16.67	Sucre	16.67	40.0	34.3	21.7	1 Mo.	Fair-Good	Fair-Good
El Salvador	2.50	Colon	2.50	41.3	44.0	32.9	1 Mo.	Fair-Good	Good
Finland	312.00	Markka	312.00	288.3	275.8	87.4	None	Good	Fair-Good
France	4.86	Franc	4.88	1,932.0	1,634.0	719.0	None	Good	Good
Germany	4.15	D-Mark	4.15	5,404.0	4,622.0	2,012.0	None	Very Good	Very Good
Greece	27.80	Drachma	27.80	222.6	183.3	160.0	1 Mo.	Fair-Good	Fair-Good
Guatemala	1.01	Quetzal	1.01	47.5	48.1	52.5	1 Mo.	Good	Fair-Good
Honduras	2.00	Lempira	2.00	9.5	18.0	12.8	1 Mo.	Fair-Good	Improving
India	6.67	Rupee	6.67	426.0	651.0	104.0	1 Mo.	Good	Good
Indonesia	200.00	Rupiah	200.00	370.0	196.0	150.0	3 Mos.	#L/C Basis	Poor
Iran	76.92	Rial	76.92	189.0	209.0	45.0	3 Mos.	Fair-Good	Good
Iraq	* 2.70	Dinar	* 2.70	296.0	284.2	18.0	2 Mos.	#L/C Basis	Fair-Good
Israel	2.50	Pound	2.50	160.8	134.6	87.3	1 Mo.	#L/C Basis	Good
Italy	615.00	Lira	617.00	2,291.0	2,774.0	1,159.0	None	Very Good	Good
Japan	377.00	Yen	392.00	1,321.0	1,105.0	1,336.0	None	Very Good	Good
Mexico	12.35	Peso	12.35	390.0	399.0	432.0	None	Good	Very Good
Netherlands	3.74	Guilder	3.77	1,372.0	1,374.0	480.0	None	Very Good	Good
New Zealand	* 2.60	Pound	* 2.60	244.0	250.0	7.0	None	Very Good	Good
Nicaragua	8.00	Cordoba	8.00	15.5	21.7	12.5	None	Very Good	Good
Norway	7.04	Krone	7.14	263.9	236.8	99.3	None	Very Good	Fair-Good
Pakistan	6.80	Rupee	6.80	303.0	265.0	23.0	2 Mos.	#L/C Basis	Improving
Panama	1.00	Balboa	1.00	40.0	45.7	128.1	None	Very Good	Good
Peru	26.66	Sol	27.77	47.1	29.3	72.0	1 Mo.	Good	Improving
Philippines	3.64	Peso	3.45	98.0	69.0	178.0	1 Mo.	#L/C Basis	Fair-Good
Portugal	27.40	Escudo	28.17	785.0	793.0	125.0	None	Very Good	Good
South Africa	* 2.77	Pound	* 2.76	366.0	334.0	43.0	None	Very Good	Good
Spain	59.75	Peseta	60.00	54.0	57.0	111.0	None	#L/C Basis	Improving
Sweden	5.13	Krona	5.17	443.0	501.0	217.0	None	Very Good	Good
Switzerland	4.29	Franc	4.33	1,867.0	2,026.0	922.0	None	Very Good	Very Good
Turkey	12.50	Pound	12.50	259.0	312.0	30.0	12 Mos.	#L/C Basis	Fair
U. A. R.	* 2.10	Pound	* 2.10	274.0	388.0	33.0	3 Mos.	#L/C Basis	Fair
U. K.	* 2.82	Pound	* 2.81	2,858.8	3,172.0	1,227.0	None	Very Good	Very Good
Uruguay	11.11	Peso	11.11	180.0	180.0	62.0	2 Mos.	Poor-Fair	Fair
Venezuela	3.34	Bolivar	3.34	692.0	1,040.0	245.0	1 Mo.	Fair-Good	Good

*U.S. Dollars per Pound #Most Exports by Letter of Credit

The Editors

Volume 15, Number 7 of INTERNATIONAL MANAGEMENT DIGEST, published monthly by McGraw-Hill International Corp., 330 West 42nd Street, New York 36, N. Y., U.S.A. Subscriptions solicited only from management executives in business and industry. Subscription price $5 (U.S.) for one year. Publication office: 99-129 North Broadway, Albany 1, New York. Second class postage paid at Albany, New York. INTERNATIONAL MANAGEMENT DIGEST and AMERICAN LETTER copyright © by McGraw-Hill International Corp., 1960.

the ultimate in air cylinder power-

BUILT-IN
ELECTRICALLY-CONTROLLED
DIRECTIONAL VALVE

BUILT-IN
DUAL SPEED CONTROLS

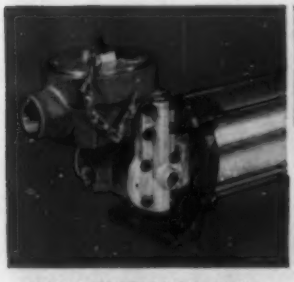
REQUIRES ONLY A
SINGLE AIR CONNECTION

THE BELLOWS AIR MOTOR®

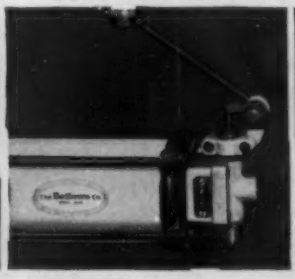
The Bellows Air Motor is a complete air cylinder power unit, with directional valve and speed controls built-in. Takes less than half the space and costs less installed than a conventional air cylinder set-up of equal power with its separate valving and piping. The single air connection, which can be made with flexible hose, makes it ideal for use on moving machine elements. It is a sturdy unit with forged steel heads, heavy brass cylinder, stainless steel piston rod. The piston rod is threaded, equipped with a wrench flat and nut. Many Bellows Air Motors have been operating day in and day out for fifteen years with negligible maintenance.

The Bellows Air Motor shown above is a 2½" bore unit equipped with the Bellows Low-Voltage (8-12V) Electroaire Valve. Other bores available are 1¼", 1¾", 3⅝" and 4½". Any stroke length. Optional choice of built-in valves as shown below.

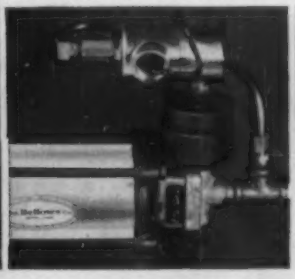
CHOICE OF BUILT-IN VALVES



115 V. ELECTROAIRE VALVE
For J.I.C. applications where a 115 v. momentary contact is desirable.



MECHANICAL VALVE
For manual operation or for use with cams or direct linkage.



115 V. MAINTAINED CONTACT
Valve remains in shifted position during period current is applied.

AIR-OPERATED
For use in applications calling for full pneumatic control.

Write for these two booklets

Fifty pages of data to help you select the right Air Motor-Valve combination for your job. Address Dept. IMD-760, Bellows-Valvair, S.A., Division of IBEC, S.A., 1 Rue de Chantepoulet, Geneva, Switzerland. In Great Britain and the Sterling area; Bellows-Valvair, Ltd., Division of IBEC, S.A., Birmingham, England. Ask for Bulletins BM-25 and SP-55.

9838-3

Bellows-Valvair

Bellows-Valvair, S.A. Division of IBEC, S.A., Geneva, Switzerland
Bellows-Valvair, Ltd., Division of IBEC, S.A., Birmingham, England

JULY 1960

VOLUME 15 NUMBER 7

International Management Digest.

WORLD BUSINESS

Russians Seek "Fair Shares". Mr. K faces problems as he offers more butter and bombs.....15

Made in Brazil: A New Competitor in Latin America? The land of coffee dreams of exporting autos, drugs, appliances to its neighbors.....16

In Latin America, Hope for New Exports? Aid may come from the proposed Latin common market.....17

How One Factory Generates New Wealth. A small enterprise can trigger wide-range prosperity.....18

U.S. Promotes Trade Rise. Trade missions alert businessmen to inter-nation opportunities.....19

MARKETING

Finding the Few that Buy the Most. Cards help salesmen focus on the "2% who buy 80%".....20

Marketing Advances. ICC adopts ad standards; cargo goes over air-truck network.....21

Consumer Caveat: Let Manufacturers Beware! Competitive testing aids the buyer.....23

MEN AND COMPANIES

French Join Forces for More Chemicals. A web of alliances, affiliates, joint ventures.....26

MANAGEMENT METHODS

Who Should Head Wickersham Mills? Let's see your answer to this drama of ideas and ideals..38

But Using It is Not Easy. Advice on a valuable, but controversial, business tool.....41

How Clupak Builds a Licensing Family. Competitive pressure helps a U.S. paper innovator..45

TECHNOLOGY

Rare Metals Keep New Technologies Growing. Demands of the space and atomic age are being met by a long list of rare and ultra-pure metals....48

Crossing a Busy Fjord with an Arch of Steel. A bridge made of thin-walled steel tubes.....53

In Brief. News about air-traffic control, polypropylene packaging, water-based paints.....55

Steel Process Doubles Output. Natural gas and lime speed up chemical reactions.....56

Zinc Fuel Cells for Lift Trucks. A top battery maker enters the fuel-cell scramble.....56

DEPARTMENTS

American Letter 1
Editors' Page 8
Business at a Glance.....13
New Products 30
Recommended Reading 59
Personal Business 60

E. E. WEYENETH, *Publisher*

PAUL R. MILLER, JR., *Editor*

Associate Editors

Alfred E. Lewis
Laurence M. Schmeidler
Thomas B. Winston

Editorial Assistants

Irma Dunay
Irene Papangelou
Gilda M. Roberts

Dexter Keezer, *Director of McGraw-Hill Economics Department*

John Wilhelm, *Director of News Bureaus*

NEWS BUREAUS

B. E. Barnes, *Atlanta*
O. M. Marashian, *Beirut*
Morrie Helitzer, *Bonn*
John Pearson, *Caracas*
Stewart Ramsey, *Chicago*
Donald MacDonald, *Detroit*
John Shinn, *London*
Kemp Anderson, *Los Angeles*
Alicja Grobtuch, *Melbourne*
Peter Weaver, *Mexico City*
Ernest Conine, *Moscow*
Robert E. Farrell, *Paris*
Leslie Warren, *Rio de Janeiro*
Jenness Keene, *San Francisco*
Sol Sanders, *Toyko*
George B. Bryant, *Washington*
Correspondents in 45 other cities

R. H. Larsen, *Advertising Sales Manager*

Angelo Minerva, *Production Manager*

INTERNATIONAL MANAGEMENT DIGEST

INTERNATIONAL MANAGEMENT DIGEST (formerly McGraw-Hill DIGEST) Overseas and Latin American Editions is published monthly by McGraw-Hill International Corporation, James H. McGraw (1860-1948) Founder. Circulation in all countries of the world except the United States and Canada.

Executive, editorial, advertising and circulation offices: 330 West 42nd Street, New York 36, N. Y., U. S. A. Donald C. McGraw, Chairman of the Board; Nelson L. Bond, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator.

Publication Office: 99-129 North Broadway, Albany 1, N. Y., U. S. A. See panel below for directions regarding subscriptions or change of address.

Subscriptions may be ordered through Fulfillment Manager (See below). Subscriptions to INTERNATIONAL MANAGEMENT DIGEST are solicited only from management men in business and industry. Subscription orders must indicate position and company name. Subscription rate $5.00 for 1 year, single copies $1.00 (U. S. currency). Second class postage paid at Albany, New York. Printed in U.S.A. ©Copyright 1960 by McGraw-Hill International Corporation. All rights reserved. Reproduction of items in full or in part without written permission prohibited in all parts of the world.

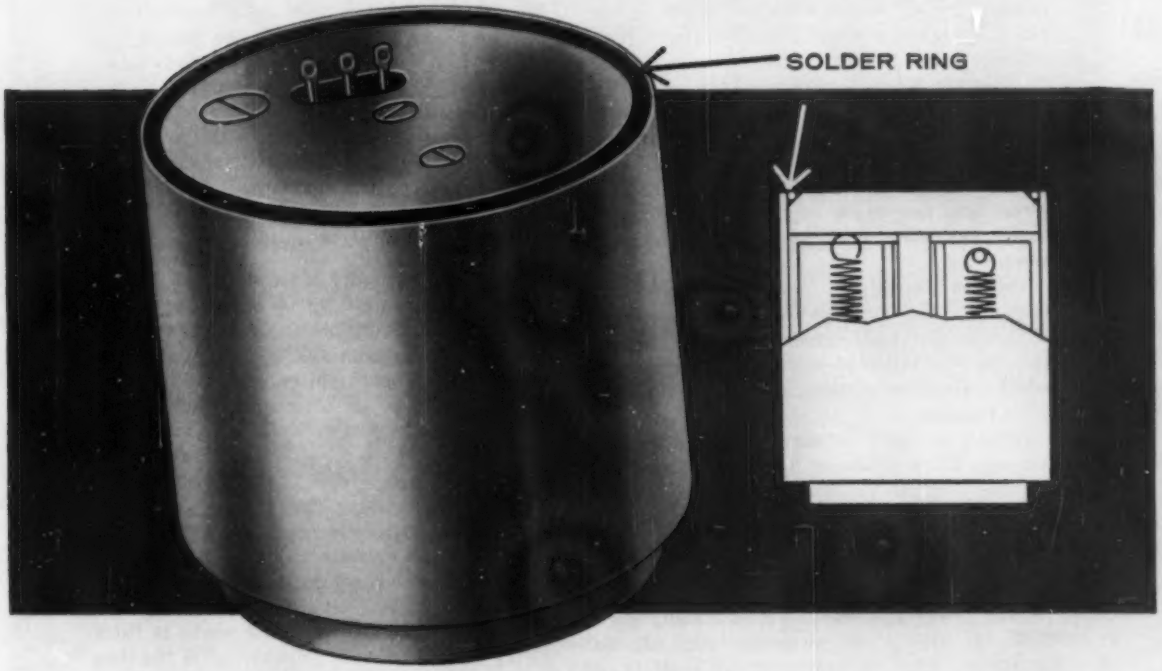
Our primary aim is to provide subscribers with a useful publication. Your comments and suggestions for improvement are encouraged. The publisher, upon written request from any subscriber to our New York office, agrees to refund the part of the subscription price applying to copies not yet mailed.

Send Subscription correspondence and change of address to Fulfillment Manager, INTERNATIONAL MANAGEMENT DIGEST, 330 West 42nd Street, New York 36, N. Y., U.S.A. For change of address please mail your complete new address as well as clipping of the old envelope showing your old address.

Audit Bureau of Circulations

Precision soldering 7 Times Faster...

with TOCCO Induction Heating*



When G. M. Giannini and Co., Inc., Pasadena, California, switched from old-fashioned methods to TOCCO Induction Heating they increased production of these high-precision accelerometers from 4 to 30 per hour—with a commensurate *decrease* in production costs.

Here's what a Giannini official has to say about the TOCCO installation: "Prior to using TOCCO for this purpose, we had tried soldering irons, normal torches, resistance sealing, and even threaded screw fittings, with uniformly poor results. Essentially, the TOCCO unit has permitted us to build, in production quantities, oil-filled hermetically sealed units that could not be produced in any other way."

Whether your production bottleneck involves soldering, brazing, heat treating or heating for forming it pays you to investigate TOCCO as an economical way to do it better, faster and at lower cost.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today—NEW FREE Bulletin

The Ohio Crankshaft Co. • Dept. JJ-7, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazing and Soldering".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

Time for Plain Talk

IMPORTANT CHANGES have taken place in the world economy. Obvious, perhaps. But the significance of these changes to international economic stability is less well understood.

The changes come to focus in the U.S.A.'s balance of payments deficit—the nation's tendency to pay out more to the world than it takes in. The deficit has been around for a decade; it has been tolerable, a result of the U.S.A.'s highly successful effort to help other nations rebuild their economies and defend themselves. Even in 1958 and 1959, when the deficit suddenly swelled and the U. S. lost a good deal of gold, many agreed that the situation was, after all, a healthy one, reflecting a more balanced distribution of monetary reserves and new vigor in the world economy. The larger deficit was a passing cloud, nothing more.

Yet some thoughtful observers have become deeply worried by this trend. This in spite of the current improvement in U. S. position, and the fair business skies over most of the world—which may have robbed the problem of its urgency.

Elliott V. Bell, Editor and Publisher of McGraw-Hill's *Business Week*, is one who is worried. He has put the problem to rigorous analysis, and in a speech a few weeks ago came up with some remarkably plain talk, directed to the international community as a whole.

"The problem is real . . . it is urgent," said Bell. "It will not go away by itself. If we temporize, delay, or neglect it, we shall do so at our great peril. If our friends abroad try to ignore or evade it, they will find that they too have done so at their peril."

WHY THIS FIRE-ALARM URGENCY? Bell explains how the U. S. postwar dominance of the world economy has ebbed, and with it the "dollar gap." He shows how major European currencies have been stabilized, how the world has, in effect, returned to a gold exchange standard, and how the dollar has become the principal reserve currency of nations.

The result, says Bell, is that for the first time since the 1930s the U. S. is subject to the discipline of an international gold standard. It has lost the freedom to take whatever measures it sees fit to maintain domestic stability. The dollar must come first, for if it falls into disrepute, the fabric of free world finance will be torn asunder.

The U. S. must take some tough, unpalatable decisions in purely domestic policies, warns Bell. But it also must see to its international position. And Bell believes that only by reducing the great assistance program—which even last year pumped nearly $5,000-million into the world economy—can the deficit be made manageable.

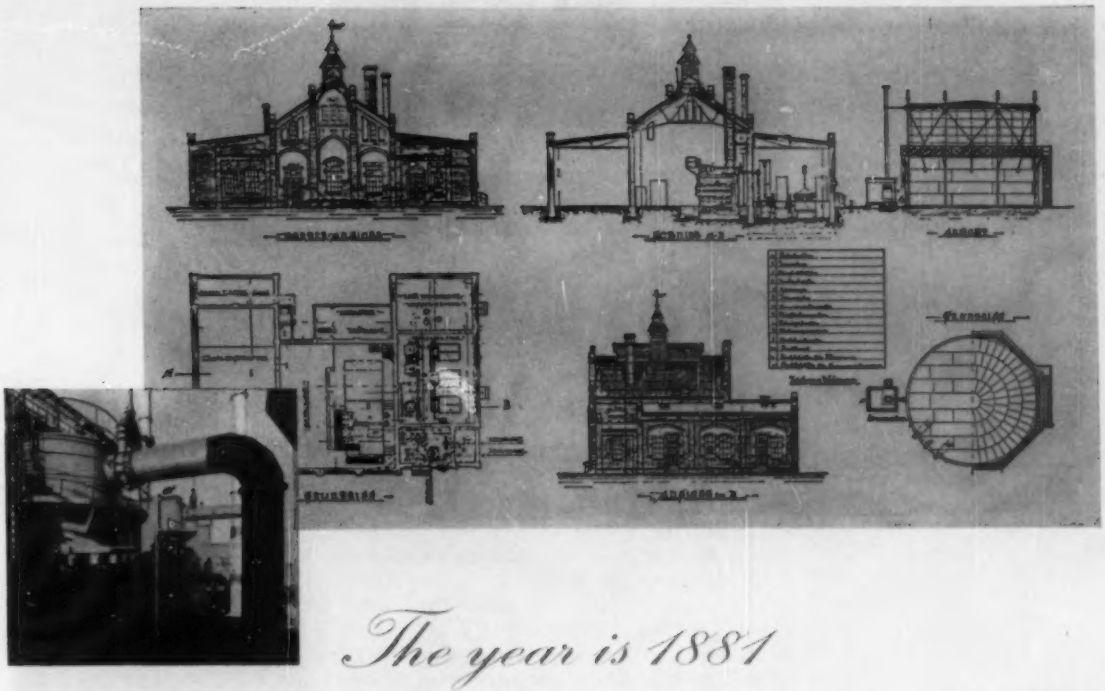
There is no alternative. Restricting imports would be disastrous. A large enough expansion of exports does not seem likely or, in Bell's view, completely desirable.

GRANT MR. BELL HIS PREMISE, and a host of other problems arise. What happens when world trade loses the prolonged stimulus of the U.S.A.'s "pump-priming"? In a world committed to full employment and welfare, are people prepared to accept the deflationary discipline of the gold exchange standard? Will other nations pick up a larger share of the defense and aid burden? What about trade liberalization? Are the major currencies standing in a realistic relationship to one another? Should there be radically new devices to expand the monetary base of the world economy?

Now, insists Bell, while the world is "still riding the flood tide of prosperity," is the time to take the measure of these complex, interrelated problems—before some world economic crisis forces hasty action. Now is the time for a new world economic conference.

The conference would be broad—to fit the breadth of the problem. It would bring together from all nations men who can set about finding solutions. Bell is no prophet of gloom—he is convinced that we have the skills and experience to deal with the problems without repeating the disastrous mistakes of the 1930s. His only fear is the "very human tendency to keep applying yesterday's solutions to today's problems."

The Editors



The year is 1881

... it's a time of great activity; Laval has just invented the steam turbine - the first steamships are plying the seaways - 50,000 Americans are sampling the conveniences of the telephone - in Europe's major cities the first power stations are under construction, but only to supply direct current - and in Berlin wide eyes and open mouths greet the first electric streetcar.

The gas industry is in the middle of a grand period of development. Gasworks are being erected everywhere, housed in imaginatively designed buildings abounding in turrets, scrollwork, fancy ornamentation - the typical architectural style of the day. The streets are lit by gas lanterns. And engineers and chemists are at work on new processes for treating and utilizing gas for the chemical industry.

PINTSCH BAMAG A. G., then BAMAG A. G., has just completed building its seventy-third complete gasworks in Europe. The company, already highly regarded as a specialist in the gas industry and general engineering, caused vast attention in 1889 with its development of a 600 H. P. "gas dynamo". In the years immediately after millions of dollars were saved by making use of waste gases from blast furnaces in high-capacity machines of this type. A model of the original today stands in the Deutsches Museum in Munich.

Throughout the 104 years of its existence, PINTSCH BAMAG has remained in close tie with the gas industry. In 1922 it set up the first fully automatic watergas plant in Europe. The engineering and construction of plants for producing water gas is still today an important part of its production activities.

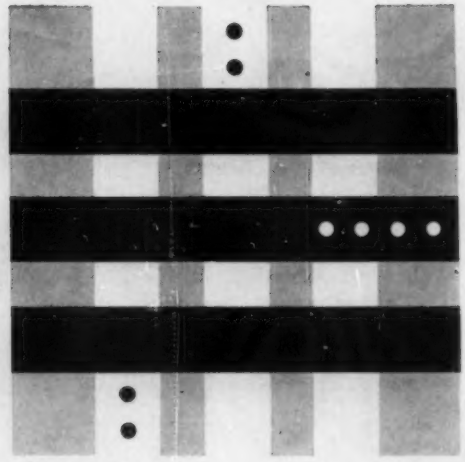
In 1926 the company built the world's first Winkler generator for producing gas from bituminous fuels by the "fluidized bed" method. PINTSCH BAMAG, sole licensee of the process, together with BASF, the licenser, worked on this process to bring it up to its present-day maturity. Winkler generators are now in operation producing synthesis gas for the chemical industries in Japan, India, Turkey, Yugoslavia, Spain, Czechoslovakia, and Germany.

Additional to watergas plants and Winkler generators, PINTSCH BAMAG gas production equipment covers oil gasification plants working to the Shell process and plants for reforming natural gas, refinery gas, waste gas from hydrogenation, and liquefied gas.

Specialists in Process Engineering

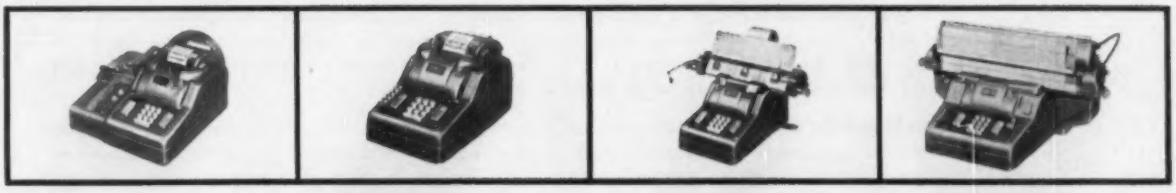
PINTSCH BAMAG
AKTIENGESELLSCHAFT

HEAD OFFICE BUTZBACH/HESSEN
WEST GERMANY



Vertical or horizontal working procedure?

Independent of whatever working principle is used, the speed and efficiency you demand of your organization is only possible with the aid of modern office machines.
Addo brings you office machines, for simple or complicated calculation; also accounting systems for integrated or electronic data processing.
From production centers on two continents Addo products are today distributed to over 100 countries.



Addo-X Model 7341-70, dual register book-keeping machine equipped with reader for paper tape or edge punched cards, reading code combinations in 5, 6, 7, or 8 channels. Addo now offers further possibilities for solving advanced problems of automation in office routines. The machines are available in both Sterling and Decimal Models.

Addo-X Model 7341-70 with reader

Addo base their foresighted production on traditional Swedish quality.

ADDO MALMÖ — S SWEDEN — Land of business machines

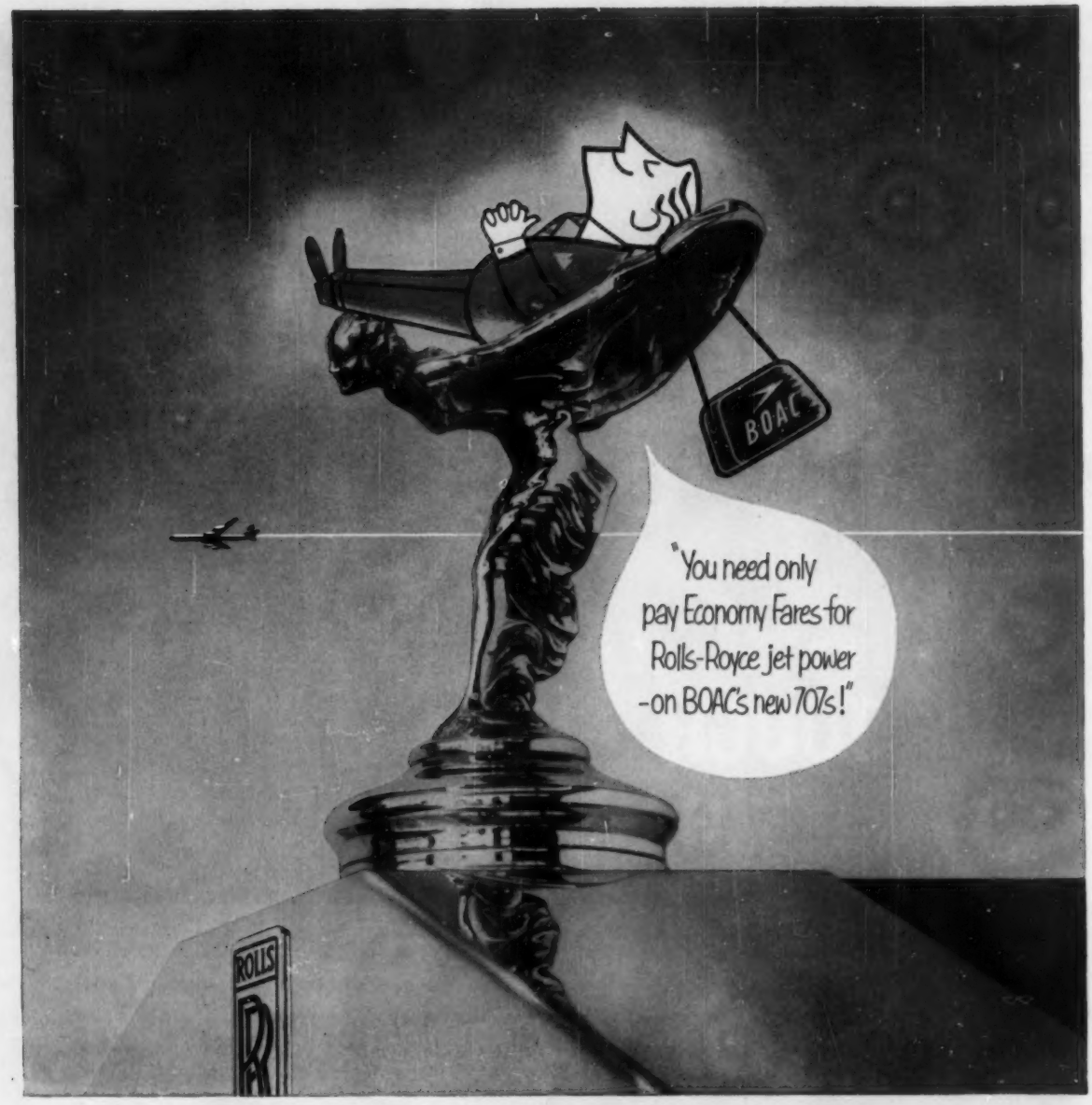
Tough-as-they-come Thames Traders are built for long hauls, heavy loads, heavy profits — for you. Built to cart and carry . . . take and tip . . . shift and spread in conditions as rough as you like to make them. Specifically—Thames Traders are moving thousands of tons of coal from open cast mines at Maesgwyn, Wales: helping in swamp filling operations at Maracas Bay, Trinidad: hauling Coca Cola bottles in the heat of the Sudan: are invaluable as Public Works vehicles in Arusha, Tanganyika. That's the sort of work that makes Thames Traders famous all over the world: the sort of toughness that keeps them ruggedly rolling however rough the going. Take a look at them the next time you see them at work and watch how willingly they come back for more!

Remember—diesel or petrol engines (4 cylinder & 6 cylinder) throughout the entire Thames Trader range!

THAMES TRADERS

G.V.W.'s from 8,720 lbs. to 33,600 lbs. G.C.W. 3,955 kg. to 15,240 kg.

BE FIRST ON THE ROAD WITH **FORD** OF **BRITAIN**



BOAC now offers the finest, fastest, big jet services non-stop between U.K., U.S.A. and Canada

BOAC Rolls-Royce 707 jetliners fly First Class and low-fare Economy Class services between London and New York, Montreal and Toronto.

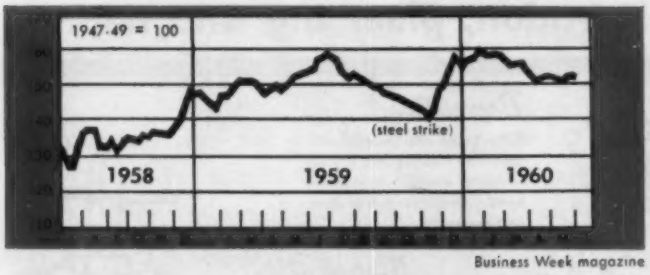
B·O·A·C ROLLS-ROYCE 707

BOOK NOW! CONSULT YOUR LOCAL TRAVEL AGENT OR ANY OFFICE OF BOAC IN THE U.K; OR BEA IN EUROPE

BRITISH OVERSEAS AIRWAYS CORPORATION

INTERNATIONAL MANAGEMENT'S

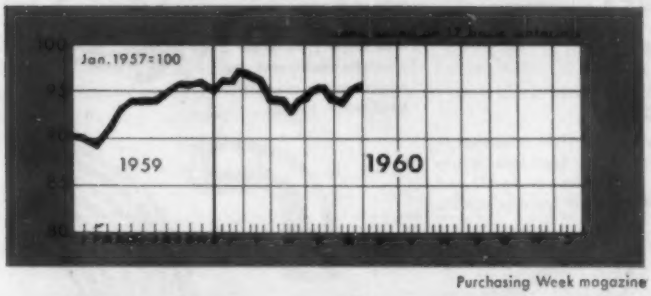
Business at a Glance



Business Week magazine

U.S. Business Trend

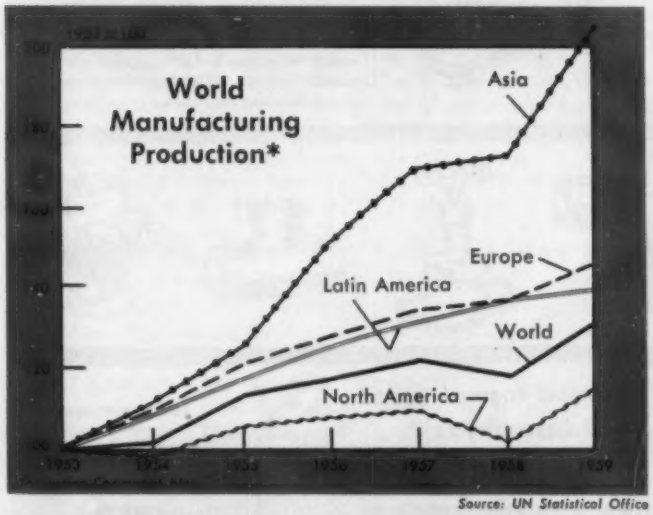
That dip in the U. S. business index (left) is largely due to falling steel output, which will go lower before it picks up in the next month or two. This is another reflection of the inventory adjustment that U. S. business is feeling. Yet the overall outlook is for a slow-but-steady rise in activity, pushed along by slightly higher defense spending—one likely reaction to increasing world tension.



Purchasing Week magazine

U.S. Commodity Trend

Some sensitive materials—rubber, copper, hides—ran the index up a few points following the warlike talk from Moscow. But most U. S. businessmen took it in stride. Confident of supply, their reluctance to build stocks has helped keep prices steady for a year. Few expect any change—provided the Kremlin merely talks. But there's this thought to keep in mind: Are businessmen letting inventories get *too* lean?

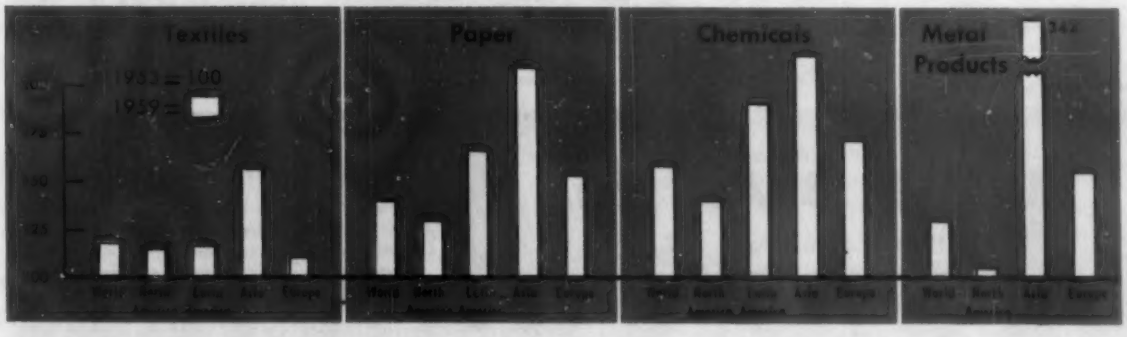


Source: UN Statistical Office

Surge in World Manufacturing

The new United Nations Statistical Yearbook 1959 is out ($8 from UN New York or local UN agents) with a wealth of information for anyone carrying on an international business. Particularly striking is the steady growth of world manufacturing production, disturbed only by the 1958 recession in North America (which, after all, carries a relative weight of 55.8% in the world index). Elsewhere, manufacturing continued growing, and last year's recovery in the U.S. pushed the index to new high ground. For 1960, the trend is still up—and, from the looks of the first six months, very strongly.

Note the startling rate of growth for Asia, primarily a reflection of Japan's exceptional performance. You see it also in several key world industries, whose 1953-'59 growth is summarized below.

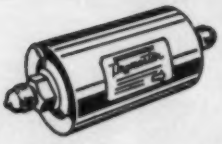


MUELLER BRASS CO.

one dependable source for quality products for air conditioning, refrigeration, plumbing and heating

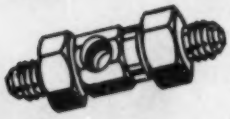
refrigeration and air conditioning

For virtually every refrigeration and air-conditioning need, Mueller Brass Co. offers high quality components, including filter-driers, strainers, valves, heat exchangers, tube and fittings, manifolds and service accessories.



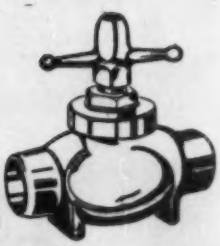
Drymaster®

Filter-Driers provide perfectly balanced filtering and drying to meet every installation need. Complete range of sizes and capacities.



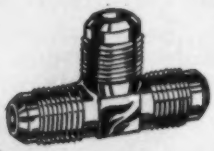
Sightmaster

Liquid indicators utilize light refraction to indicate refrigerant level. Can't leak, shock-proof mounted . . . in single or double port models with flare, solder end connections.



Globemaster

Packed line valves, available in straight-thru and angle types, are carefully engineered and constructed to give long, trouble-free service.



FITTINGS

Mueller Brass Co. produces a complete line of both solder-type or flare fittings in a range of sizes and styles to accommodate every type of refrigeration installation. Manufactured from seamless copper tubing, forged brass or brass rod fabricated in our own mills.

180° RETURN BENDS

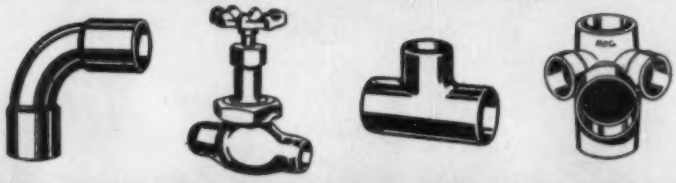
A complete range of sizes . . . condensers, cooling coils, etc., with plain or cupped ends. Both O.D. wall thicknesses and center-to-center dimensions carefully matched to customer's specifications.

TUBING

Mueller Brass Co. Streamline dehydrated seamless soft copper tubing and hard drawn copper tubing, available in all required wall thicknesses, will fill all piping, refrigeration and air conditioning requirements.

plumbing and heating products

Streamline copper tube, solder-type fittings, valves and accessories are the industry's highest quality products in design, material and workmanship. Streamline plumbing and heating products assure efficient, long-lasting installations.

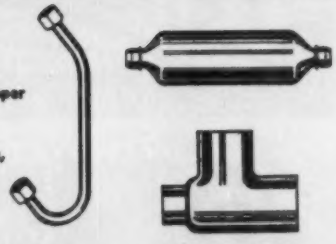


PVC pipe and fittings

Mueller Brass Co. has a complete line of Normal Impact and High Impact rigid PVC pipe and fittings manufactured from unplasticized polyvinyl chloride. Provides exceptionally long service life under severe corrosive conditions . . . ideal for chemical handling and industrial processing.

formed copper tube and assemblies

Mueller Brass Co. supplies formed copper tube and assemblies to customer's specifications. Complete facilities for swaging, bending, spinning, upsetting, flaring, flattening or sealing, beading and grooving, drilling, piercing, machining, joining . . . all at consistently close tolerances.



MUELLER BRASS CO.

Port Huron 43, Michigan, U.S.A.
Cable address: Streamline

GENERAL INFORMATION

For sugar and paper mills, breweries, distillers and other industrial applications, Mueller Brass Co. copper tubing is supplied to customer's specifications. Mixed groups of items can be packed for delivery to different job sites for any customer, eliminating rehandling costs.

International Management Digest | July 1960

Russians Seek "Fair Shares"

Pressures from the people are mounting. But Soviet resources for use at home—and abroad—are strained, and there's a new hard mood in the Kremlin.

MANY ARE THE PRESSURES on the men in the Kremlin. And as observers throughout the world sifted through the wreckage of the ill-fated "summit" meeting and the events that followed, there were many differing expert views on what was going on in Moscow.

But one point was common to all interpretations: that the Soviet people are restlessly seeking a larger share of their nation's resources. They want more and better consumer goods, housing, leisure. The irony of flimsy, poorly-styled consumer products—or no products at all—in space-age 1960 is not lost on the increasingly sophisticated Lunik-minded Russian.

If, as seems likely, the Soviet leaders now attempt to speed up their economic activities among the developing peoples of Africa, Asia, and Latin America, it is worth remembering that they have a "revolution of rising expectations" to face right at home.

• **Morale**—To be sure, consumer demands in Russia have not reached critical intensity. The Kremlin's political problem is more like that of a military commander concerned with the morale of the troops rather than that of a Member of Parliament or Congressman who must satisfy the minimum demands of his supporters. But there is reason to believe that the pressure will rise for a change in the allocation of Soviet resources.

There are signs that concessions granted so far to lower-income groups have whetted their appetite for more. On the other hand resentment is bound to rise among the higher (and more influential) groups as their standard of living is cut to appease the lower groups.

The events of May clearly worried the Russian people. They fear that the U-2 incident, signs of disagreement in the ruling hierarchy, and Defense Minister Malinovsky's tough rocket talk all threaten a return to the hard times of Stalin's day.

• **Reassurance**—It is significant that as soon as he returned from Paris, Mr. Khrushchev went to great lengths to assure the people that this was not the case. The policy of improving living standards, he insisted, will go on.

This month should give an indication of Khrushchev's sincerity. The Central Committee of the Communist Party has scheduled—and widely advertised—a plenary session July 13 specifically to discuss consumer goods. It will be difficult not to deliver on at least some of the promises.

I. Mr. K.'s "New Deal"

Joseph Stalin succeeded spectacularly in building the industrial base for a modern society. He did it ruthlessly—and quickly. But even before he died the economy reached a point of maturity at which his combination of compulsion and extravagant incentives for specific jobs was paying diminishing returns in quality of output and productivity. As workers learned more technical skills—the kind of skills that make possible a sun-orbiting space vehicle, for example—pressures mounted for more equal rewards. And as in capitalist countries at an earlier stage, the emergence of a mass-production economy led to at least passive demands for a "fairer share."

It was left to Malenkov, then to Khrushchev, to develop a more flexible structure, more suited to Russia of the 1960s.

• **New Deal**—Since his arrival in power, Khrushchev has carried on a social and economic revolution that some observers compare in scope—if not in motivation—to Roosevelt's "New Deal" of the 1930s and to the emergence of the European "welfare" states. To underprivileged peasants, Khrushchev gave higher prices for crops, lower taxes, freedom to farm private plots. The industrial worker was granted a minimum wage, more housing. Pensions were increased, compulsory state loans were eased.

Recently Khrushchev has been cutting down high incomes. The once princely fees of top artists and entertainers have been slashed; academicians are now forbidden to accept remuneration for more than one job. The system of bonuses for industrial workers is being drastically overhauled to narrow disparities. And Khrushchev promises to shorten the work week to 41 hours.

• **Taxes**—In May, another extremely important step was taken: the announcement of a gradual, progressive elimination of the income tax in a manner designed to benefit lower income groups. In overall economic terms the tax reform will not mean much. Income tax rates are low; sales taxes are the prime levy. But the "levelling" intent in tax policy is there for all to see.

Despite these reforms the Soviet economy remains oriented to the growth of heavy industry rather than consumer-oriented. That growth has been impressive. And while the absolute amount of goods available to the consumer has increased (from a very low level) by roughly 5% annually in recent years, the share of total production made available for personal consumption has probably declined.

II. Tightening Up

The Kremlin has several alternatives. One is to cut back on the

heavy industry-armament sector to benefit consumers. This is highly unlikely, given the present mood of Soviet leaders—and especially of the military. Another is to reduce international commitments—to the Chinese, to East European satellites, and to non-Communist countries. Again, unlikely. The probable course is to go on as before—but with new vigor behind efforts to eliminate waste resulting from mismanagement and poor production techniques. This might squeeze out something more for consumers without stinting arms and allies.

• **Costly**—Waste, quality rejects, nand labor offer a grotesque and costly contrast to ultra-modern, highly-automated Soviet production facilities. The two often exist side by side. For example:

—A machine tool plant uses outdated equipment while new casting machines, lifts, and cranes stand idle in a storehouse. Why? The planners did not provide funds for necessary construction.

—The oil industry complains it cannot get small diameter pipe, because suppliers, their quotas expressed in tons, produce heavy pipe with thick walls unsuitable for small wells.

—A high-ranking engineer reports that 42% of all spare tractor parts his group has inspected are almost worthless.

The Khrushchev regime has tried hard for the past few years to tidy up the mess—but with little success. Now some new remedies are taking shape.

One may have been the recent appointment of former chief state planner Alexei Kosygin to the rank of First Deputy Premier. Young, reportedly impatient with the state of the economy (and closely associated with the consumer goods program), Kosygin now has the authority to do something about it.

The system of material incentives, which tends to emphasize quantity to the exclusion of all else, causes Soviet industry to resist innovation. Too much time spent on quality, or time lost running in new equipment, can interfere with a worker's plan for a new suit of clothes or a manager's determination to meet his quota.

Kosygin's job will be to put a greater effort behind recent experiments to insert some "competition" into the system. Last December a new incentive plan was announced, an attempt to peg bonuses to quality, low-cost, and productivity as well as quantity. Industries in different regions will be required to "compete"; there are even proposals to actually brand products with the factory's name and location.

• **Manpower** — Speeding automation is a vital matter. The labor force's growth rate is declining—yet some 2-million Russians in industry are engaged in manual loading and unloading operations; railroads still employ 100,00 persons for hand switching.

The Soviet purchasing and distribution system is in need of repair. It is under attack for costing too much, for fostering inefficiency, breach of contract, and corruption. A feature of the system are the *tolkachi*, literally "pushers," who are hired by all enterprises to use whatever means required to assure delivery to their clients of hard-to-get materials.

Aiding Kosygin in the clean-up task will be the new "raiding brigades" of party members, journalists, and others who prowl through the economy in search of incompetence and waste.

III. Strained Resources

All of these industrial problems put a tremendous strain on Soviet resources. Added to them are the fact that agricultural output keeps falling short of target; the fact that the Soviets find it difficult to finance and procure the machinery imports they need; and the demands of foreign policy.

The latter is especially pressing. The Chinese whose dealings with Moscow have been severely strained and who have been repaying, not receiving, Soviet loans, may well insist on more assistance. In East Europe, the job of welding a really solid economic bloc is really just beginning. And most observers are convinced that the Kremlin will want to widen its economic penetration of "uncommitted" nations—in the Middle East, Asia, and in Africa and Latin America, two areas with an apparently new high priority. All of this means more money and goods that the Soviet government cannot make available at home. (*Business Week—May* 14, *p*28; *May* 25, *pp*25, 157, 172; *May* 28, *p*26.)

Made-in-Brazil

The land of coffee hopes to export more manufactures. But the difficulties are severe.

A FEW MONTHS AGO Volkswagen announced that it would shortly ship light trucks from its Brazilian plant to the U.S.A. The first order was for 300, and Volkswagen of America—with customers standing in line for trucks—hoped more would be coming.

Brazil—land of coffee, rain forests, and Copacabana—about to ship vehicles to highly-industrialized North America! The news evoked visions of a new Western Hemisphere competitor among American, European, and Japanese industrialists. And it sent a wave of pride through Brazilians.

But for the time, at least, facts do not justify these reactions. For the deal to export VW's ran into a difficulty that plagues Brazil's export hopes.

• **Satisfied?**—To get an export license, a Brazilian manufacturer must show that home demand is satisfied. In this case the government seemed to willing to set aside this regulation; VW argued that the sale would earn hard currency to pay for more parts to make more vehicles in Brazil.

But auto-starved Brazilians, waiting months for delivery, were irked at the thought of Yankees paying only $2000 when the cost to them is higher by almost 50%, thanks to the staggering burden of taxes that each vehicle carries in its selling price. They complained. And in the resulting uproar, the government hesitated.

"O negocio esta parado"—the deal is stopped—a Bank of Brazil official told INTERNATIONAL MANAGEMENT. And he offered little hope of any policy change in the near future.

The VW case illustrates Brazil's hopes of exporting manufactures. The nation sees itself as the industrial leader of Latin America. Already half the national income is generated by industry and services, and Brazilians nurse an ambition to be the workshop of South America, and an occasional competitor in other markets as well.

A New Competitor in Latin America?

The Latin American Common Market now being established reinforces this ambition. But realizing it may come hard. Though Brazil's sales of manufactured goods have grown, they are still infinitesimal compared to coffee.

• **No Incentive**—The central fact is that domestic demand is far from satisfied and government has done little to stimulate manufacturers with a true export incentive. Until that incentive is available, and until "red tape" that envelopes most export transactions is removed, manufacturers will not try hard.

Insisting that it wants to diversify exports, the government has a new trade coordinating group, which recently rushed a sales mission off to Venezuela. But many Brazilian businessmen doubt that government will accomplish very much. As for themselves, they are too caught up with domestic problems to worry about export.

But you find some who are active —and optimistic.

• **Growing**—"We have been making sales on a small but growing basis to Uruguay and Paraguay, and we expect business to increase," says an appliance manufacturer.

In the truck field, some new legislation provides an incentive not present in passenger cars. One company is negotiating to supply buses to Argentina, and it believes it can net 30% more on the sale than at home—and still compete with the same bus offered by a European parent company. Why? Because buses, unlike cars, require a high proportion of hand work, and Brazilian labor costs are lower and the productivity of workers high.

But even here there remains

Continued on next page

In Latin America: Hope for More Exports?

*est. National Planning Assn.

BRAZIL'S EFFORT to export manufactures gains added significance from the chart above. For the chart presents a disturbing picture of Latin America's sales to the U.S.A., which now absorbs 45% of its exports, and—by implication—to other world markets. According to a recent study by the U.S.A.'s National Planning Assn.,* physical volume of exports to the U. S. actually declined in the 1950-'58 period. And worse, the outlook for the early 1960s indicates an expansion of no more than 1% yearly. Plainly, this is not enough.

Others are speaking to the same point. A few weeks ago, William F. Butler, an economist and Vice President of the Chase Manhattan Bank in New York, stated that the export problem, among others, raised a serious question about Latin America's future growth. And the U.N.'s Economic Commission for Latin America recently guessed that exports may barely keep ahead of population growth, much less grow enough to finance the huge imports of capital equipment that the area requires.

WHAT HAS HAPPENED? For one thing, Latin America depends for its livelihood on relatively few raw materials. Prices of most internationally-traded commodities are weak; supplies are bulging. And, according to the NPA study, the next few years do not promise any significant improvement.

Add to this the fact that the U.S.A.—and others—maintain import barriers, heavy taxes, and other restrictions against such Latin American products as lead, zinc, petroleum, copper, coffee, sugar.

For their part, Latin Americans have in their zeal to industrialize courted inflation, and have been forced to erect elaborate controls that tend to discourage investment and exports. Lopsided growth results. One side effect is that in some nations local facilities for production of nondurable consumer goods has far outrun the local market. Another result of these factors—and perhaps of political instability—is that foreign investment in Latin America appears to be slowing.

WHAT CAN BE DONE? "If this were the entire story," says Mr. Butler, "the outlook would be bleak indeed." But there are some hopeful signs.

One is that several governments are striving to control inflation and to free business from stultifying controls (Argentina, Chile, Colombia, Ecuador, Peru, Uruguay, Mexico are examples). Perseverance in applying sound-money policies should sooner or later pay dividends in the form of an improving business climate and more competitive exports.

As to diversification of exports, the NPA study sees promise in a broad array of minerals, foodstuffs, forest products. Also it suggests some immediate opportunities in sales of manufactured specialties to the U.S.A., where the import market for light consumer non-essentials is growing prodigiously. In the more distant future, says NPA, Latin America may even develop markets for more "industrial" goods such as radios, plastic and steel products.

But first, Latin American governments must do much more to stimulate sales—extending tax and credit incentives, and mounting vigorous export promotion programs.

It is equally urgent that customer nations remove restrictions against Latin American goods. NPA estimates that U. S. purchases would grow by as much as 50% with a complete removal of barriers, and urges that a start be made soon—and with no strings attached.

To this, Mr. Butler adds that the U. S. should increase its assistance and loan programs, and sincerely support the awakening Latin American common market, which holds great promise for the area's industrial and export development.

* *The Future of Latin American Exports to the United States:* 1965 and 1970; *National Planning Assn., Washington, D. C.; April* 1960; $2.00.

the problem of "headquarters." Since Brazil's burgeoning industrial plant is sprinkled with foreign-based owners and part-owners, some division of markets will have to be made. Parents in Europe or the U. S. who are willing to see some soft currency markets taken over by their Brazilian affiliates will resist that competition elsewhere.

• **No Ship**—Transport poses other difficulties. No shipping lines operate regularly from Brazil to other Latin American nations—except to Argentina and Uruguay. Road connections are still inadequate, or non-existent. Mercedes-Benz, which could sell quite a few trucks, is considering sending some to Venezuela lashed to the decks of returning petroleum tankers.

Financing is a frequent stumbling block. Nothing like the U. S. Export-Import Bank exists, and few businessmen can carry the terms that European, Japanese, and Americans offer customers.

To date, Brazil's manufactured exports have been largely sporadic, in response to temporary shortages elsewhere (some steel went to the U. S. during the 1959 strike). But among its products there are quite a few with export potential.

Automotive: Experimentation is going on. Willys has sold some $500,000 worth of Jeeps to Chile, others to Bolivia, even Indonesia. There's promise for exports of parts needed to maintain models no longer made in other nations.

Home appliances: Chile got $488,000 worth of sewing machines last year. These, plus polishers, gas stoves, washers, have moved to several Latin nations.

Drugs: Manufacturers say they would have little trouble supplying the South American market.

Farm equipment: The industry is just getting started. Yet it has hopes of selling in neighboring lands, possibly in Asia and Africa too. Some sprayers, dusters, processing tools have been exported.

There are other possibilities. Last year Brazil sold small amounts of construction materials, plumbing fixtures, barbed wire, syringes, shoes ($78,000 worth of rubber overshoes to the U. S.), wines, molds, ceramic articles, and tires. ●

How One New Factory Generates New Wealth

THIS ILLUSTRATION traces the economic effects of a new factory with an annual payroll of $224,000 in a developing nation of Asia, Africa, or Latin America, where the "revolution of rising expectations" is in full cry.

This $224,000 is a drop in the ocean of development needs—which are measured in the thousands of millions, for huge investments in public works, for big projects in mining and manufacturing. But according to a recent discussion in *The Director*, journal of Britain's Institute of Directors, the significance of the small, individual factory is sometimes overlooked.

Often, says *The Director*, the need is for many small factories rather than for a limited number of larger undertakings with their greater demands on scarce capital and managerial resources. And tax and other concessions, together with capital assistance now available from a variety of sources, make it possible for almost any manufacturer in an industrial nation to consider setting up a plant in a developing area.

• **Example**—Such an area is the West Indies island of Jamaica. *The Director's* example above is relevant to conditions there.

Stage one in the process involves initial planning. When the industrialist decides to go ahead, he first employs technical consultants, marketing and legal help. To the extent that local services are used, or outsiders spend money locally, new income is created.

Stage two involves clearing the site, and building. Necessary improvements increase the value of the site and nearby property; then new capital in the form of machinery adds further wealth. All these stimulate purchases and employment in the local economy.

• **Injection**—Stage three sees the factory in operation. The 300 employees are drawn mainly from the ranks of the unemployed or the under-employed. Thus their purchasing power is sharply increased. Then stage four brings the start of the economic cycle, as the $224,000 annual payroll is injected into the island economy.

The following table, from some recent data on workers' spending in Jamaica, shows how the new factory's payroll might be spent:

Item	% share of payroll
Food	36.6
Transport	11.2
Clothing, Personal Effects	10.6
Household Operation	7.7
Beverages, Tobacco	7.6
Recreation	7.2
Rent	6.0
Furniture, Household Goods	3.8
Personal and Health	3.3
Fuel and Light	1.1
Miscellaneous	4.9
Total	100.0

• **Cumulative** — A finer breakdown would show that in retail trades, for example, sales would rise by almost $130,000—and the equivalent of three new shops would be required. Service businesses would find their market bigger by $30,000. Throughout the island, existing sources of supply would expand.

Finally, the new factory would eventually generate a minimum of $28,000 yearly in personal and company taxes which the government can use to create the conditions—more roads, a better port, new schools—which would attract new investors and stimulate growth. ●

U. S. Promotes Trade Rise

Washington sends more trade missions abroad; offers more business-advisory services to foreign firms.

ONE DAY toward the end of May, American businessmen were alerted to well over 200 new trade opportunities in Africa at a conference sponsored by the U. S. Department of Commerce in New York.

These leads were uncovered by Commerce Department Trade Missions sent to West Africa and to the Federation of Rhodesia and Nyasaland earlier this year, as part of the U.S.A.'s growing export promotion program.

The businessmen showed much interest. They asked questions about the availability of local capital for joint ventures; they wondered about credit terms, inventory requirements, long-range market prospects for their goods, extent of European competition in Africa, shipping requirements.

But will the Americans follow up these opportunities? According to results from previous missions, they will. Charles F. Boehm, of the Bureau of Foreign Commerce in Washington, points out that after the last U. S. mission to Bombay, India, more than 300 American business proposals were made to Indian concerns, and about 400 the other way. And there is evidence that some of these proposals resulted in commercial transactions.

• **Other approaches**—Trade missions are just one part of this effort by the Department of Commerce to help Americans, and to assist foreign businessmen to buy and sell in the U. S. market, to obtain—as agents—U. S. product lines, to find capital, licensors or licensees.

The best way to make use of the Department's facilities, officials say, is to work directly through American embassies and consulates. Most of them have commercial officers who will sit down with a business executive and discuss his trade proposal. And Washington's export promotion plan calls for strengthening this business-advisory activity.

The commercial validity of the proposal is carefully checked out by the commercial officer. At the same time, the foreign businessman furnishes background information about his firm, to be printed in a "World Trade Directory Report". This is a confidential statement sold only to qualified U. S. citizens, and not for secondary distribution.

• **For example**—A typical report will give the name and address of the businessman, method of operation, lines handled, size of the firm, sales territory, names of the owners and/or officers, capital, sales volume, and the firm's general reputation in the trade and financial circles of the country.

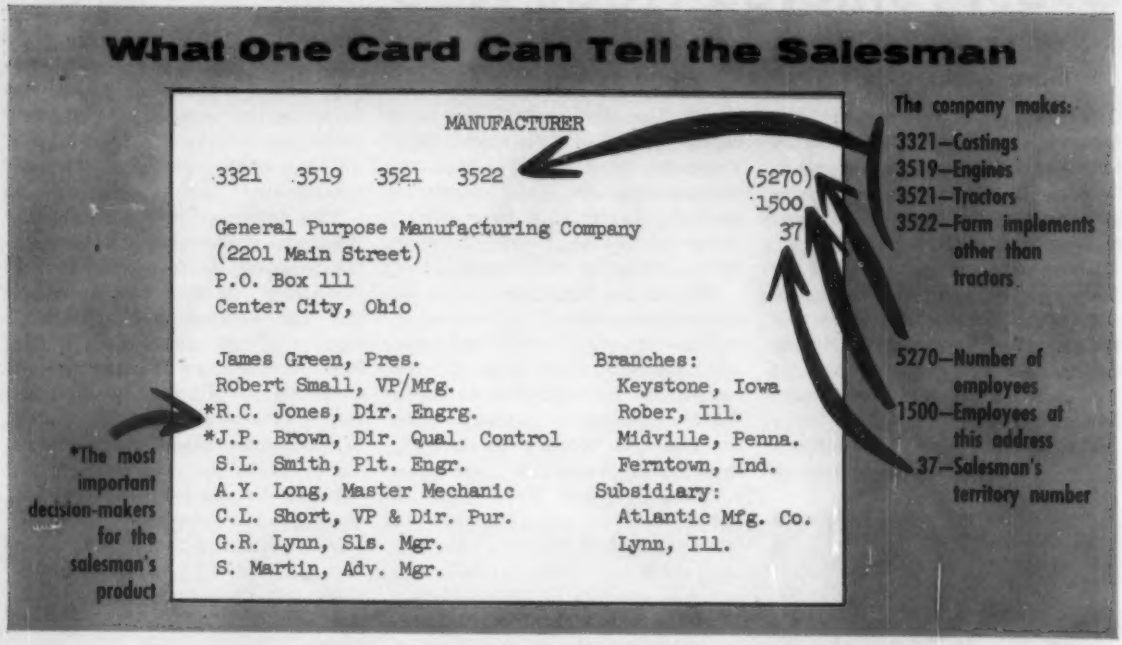
It will also list basic data on the acceptability of a firm or individual as a sales or purchasing agent, supplier, or distributor. The reports are not intended to provide credit information. Most American foreign traders use them primarily to supplement commercial credit reports and to determine the suitability of establishing trade relations with specific foreign enterprises.

This information, together with the proposal (which now becomes a "trade lead") is forwarded to the Commerce Department in Washington, and printed in the Department's official publication, "The Foreign Commerce Weekly" (about 36 pages weekly, with more than 10,000 subscribers). Leads printed in this magazine also receive large secondary distribution from trade publications and local and regional chambers of commerce.

The Commerce Department finds that hundreds of business negotiations are initiated each week, thanks to leads printed in its publication. An excellent illustration is the recent report received by Commerce officials from Wellington, New Zealand, that a prominent drug retailer has received almost 140 responses to a trade opportunity listed in the "Foreign Commerce Weekly".

Requests from foreign governments seeking bids on large development projects are quickly forwarded to the Commerce Department by commercial officers and printed in the magazine. (Government statements are taken pretty much at face value.) But one bit of advice given by Commerce authorities: Provide ample time before bid deadline; many are too short to get maximum response.

• **Itineraries, too**—In addition, the Commerce Department helps to pave the way for a foreign executive planning a business trip to the U.S.A. If he outlines his program to a commercial officer prior to departure, the information is published in the "Foreign Commerce Weekly". The lead will cite data on the purpose of the visit, its length, the cities to be visited, and other pertinent facts. Thus, when the visitor arrives at any of the 33 field offices of the Commerce Department in the U.S.A., he can be brought into contact with American companies with a valuable saving in time. ●



Finding the Few that Buy the Most

SALESMEN often overlook their best prospects. In marketing, this is a truism: It is inefficient to allow salesmen to depend on their own list of prospects.

This is why there are more and more "card-carrying" salesmen. In effect, the card above returns sales control to where it belongs—to the hands of sales management. Guided by such cards, salesmen concentrate on "the 20% who buy the 80%."

The card is a replica of ones used by the Cummins-Chicago Corp., a U. S. manufacturer of invoice canceling and perforating equipment ("You can't erase a hole"). The sales control system was developed by the company's advertising agency, Waldie and Briggs, Inc., Chicago, which maintains a "master file" for its clients.

The agency keeps cards on each customer or prospect for a wide variety of products. Information is gathered from salesmen's reports, marketing research, and other sources; the cards are constantly being updated.

• **Numbers Games**—The classification system (see above) is not as complicated as it may look. The numbers are taken directly from the U.S.A.'s Standard Industrial Classification (SIC), which is a national version of the International system (ISIC) used and recommended by the United Nations Statistical Office. Most U.N. member nations use similar, but not identical systems.

In the U.S.A., there are a number of directories that classify companies and plants according to their major activities, including McGraw-Hill's *America's Manufacturing Plants*. These directories are the starting point for Waldie and Briggs. In some countries, a company might have to begin with an unclassified directory, or its own sales records. But classification is not an overwhelming task.

Based on its own information, Waldie and Briggs adds many classifications to the ones found in directories. "This is important," comments Warren Segersten, director of marketing for Cummins-Chicago. "We are after establishments—and each plant differs, even within the same company."

Published directories might list a plant as making tractors and engines, for instance, but not as having a foundry for castings, such as the example above. For many salesmen, this is a valuable addition.

Another problem is to identify buying power in multi-plant companies. In the published listings, central administrative offices often are not directly linked with outlying plants. Where practical, the sales control cards list branch plants and subsidiaries.

• **Sales Analysis**—By analyzing its card files, the Waldie and Briggs agency has established some vital marketing facts. The agency claims that for U. S. industry in general, 20% of the establishments account for 80% of all industrial purchases. The specific figures vary from industry to industry, of course. Cummins-Chicago bases its sales program on the 20-80 principle.

"We are identifying a larger percentage of high potential prospects," comments Segersten, "as well as isolating key buying influences in prospective plants."

For Cummins-Chicago, the size of a plant is a key factor. Small plants do not have enough paper work to need much office equipment. By eliminating "fringe calls," salesmen make each call more productive. Cummins-Chicago uses 500 employees as a cut-off point.

• **Benefits**—"Our system gives us a sound basis for determining ter-

ritories and the number of salesmen needed to sell them," explains Segersten. "The salesman does not tell us; we tell him." Conversely, management has criteria for evaluating sales effort.

To the company's advertising manager, John Below, sales control gives a "cleaner profile" of the company's customers: "We have a better basis for budgeting since we are sure of a greater return for each dollar spent. Mailings go to fewer —but more important—people, and thus more frequently."

The "cleaner profile" also helps the advertising agency in selecting appropriate advertising media, and in writing advertising messages for specific audiences.

"Incidentally," adds Segersten, "we explain the sales control system in various direct mail programs. The number of inquiries resulting from these promotions are high and provide the basis for additional calls and discussions." (*Sales Management, Apr* 15, *p* 123)

Marketing Advances

Advertising Standards: Proposals adopted by the International Chamber of Commerce at a recent meeting in Venice could lead to uniform contracts, rate cards (but not rates), and conditions of payment in two important advertising media. The proposals set the stage for more efficient use of advertising worldwide.

For outdoor advertising, the ICC recommends 19 standard contract provisions; for the business and technical press, there are 20 specific items of basic information. With time, the ICC suggests that mechanical conditions—such as column widths—can be standardized, too.

Truck-Air Cargo Network: International air shipments to and from U. S. and Canadian gateway cities can now have direct truck connections to inland points. By an agreement between Pan American World Airways (the international carrier) and Consolidated Freightways (the inland carrier), either carrier accepts complete responsibility for door-to-door delivery of cargo, including all paperwork and a joint invoice.

How Regional Storage and Conditioning

Protects Good Corn Crops From Guatemala's Damp Climate

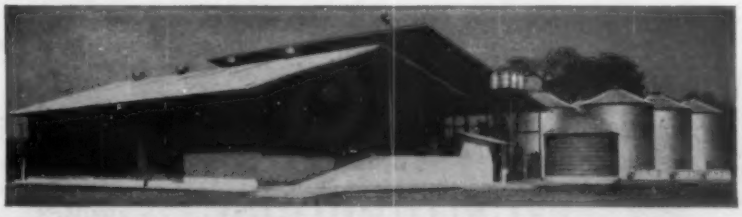
Guatemala's rich damp bottomlands are ideal for growing fine crops of corn . . . but keeping the crops in storage was another problem . . . they spoiled fast in the humid climate. Small but complete regional conditioning and storage plants, easily accessible to the growers, have been found to be the answer, after research by the Instituto de Fomento de la Produccion—the Guatemala development commission. Working with Columbian engineers, INFOP has established five such plants in the corn growing regions. Each plant has facilities for receiving, weighing, drying, cleaning, fumigating, aerating and storing the corn produced in that area.

More than 26,000 bu. of storage capacity is provided by eight Columbian Steel bins at each of Guatemala's five regional grain storage and conditioning plants. The bins are equipped with perforated steel floors and use portable aeration units for grain conditioning.

A Columbian 40′ x 80′ Rigid Frame Warehouse contains the administrative offices, receiving equipment, and storage area for sacked grain. A screw conveyor takes the corn to the drying and cleaning facilities in an adjoining open-sided Columbian lean-to building. A 1,000 bu. Columbian Red Top Grain bin is used for Fumigating bagged grain. Bulk corn is stored in eight Columbian 3,300 bu. Grain Bins equipped with Columbian perforated floor conditioning systems. The bins are filled and emptied by portable augers and the portable conditioning units can deliver warm or cool air as the occasion demands.

Pioneers in steel grain storage and grain conditioning equipment, Columbian has helped many friendly nations and individual firms solve their grain conservation problems with Master-Crafted Columbian steel bins, steel buildings, grain elevators, grain handling and conditioning equipment.

Columbian will be glad to consult with you on your requirements. Write **Columbian Steel Tank Company, International,** P. O. Box 4013-L, Kansas City, Missouri. Consult Columbian also for contract steel fabrication.



Receiving equipment, sacked grain storage and administrative offices are housed in a Columbian Rigid Frame Building at Guatemala's regional grain plants. The grain drying and cleaning facilities are in the open side shed building whose steel roof can be seen behind the main building. The smaller bin at right is used for fumigating bulk grain.

LIMITRAK insulation

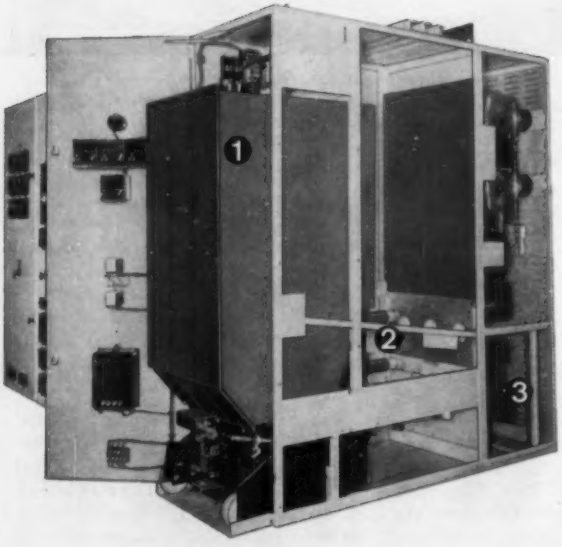
ANOTHER

Westinghouse

FIRST

IN

SWITCHGEAR



(1) Limitrak Glass Polyester, a new Westinghouse-developed insulation, has been tested and proved to be 300 times more track-resistant than ordinary glass polyesters, 1,200 times more track-resistant than phenolics. Westinghouse uses it for arc chutes, end channels and supports on DH breakers; adds **(2) Limitrak Coating** to DH breaker bushings; and, to provide maximum phase-to-phase, phase-to-ground fault protection, incorporates **(3) Limitrak Design** in porcelain insulation components such as vertical bus supports.

This **Limitrak Insulation System** — first to offer truly balanced protection in metal-clad switchgear — is the latest in a series of over 50 major switchgear advances by Westinghouse. Among them:

- *The first power air circuit breaker, installed on a commercial circuit 12 years before any other manufacturer entered the field.*
- *The first drawout air circuit breakers that engage without lifting.*
- *The first complete line of standardized assemblies, each unit fully built, wired and tested at the factory.*
- *Shelterfor-M, the first metal-clad switchgear to give all-weather protection of equipment and personnel at outdoor installations.*

These and the many other Westinghouse "firsts" demonstrate one fact: you get the most advanced, most dependable switchgear by specifying Westinghouse. For more information on Westinghouse metal-clad switchgear, write for booklet O-A. Westinghouse Electric International Co., 40 Wall Street, New York 5, U.S.A.

YOU CAN BE SURE... IF IT'S

Westinghouse

Consumer Caveat: Let Manufacturers Beware!

As consumers organize—in Britain and elsewhere—management has a new force to reckon with.

CONSUMERS' UNIONS—dedicated to increasing the sophistication of buyers in this age of mass markets—are gaining strength around the world. These independent, nonprofit organizations do comparative testing of products and services, then publish the results.

Sometimes those results say: "Caveat Emptor." More important, they say: "Caveat Factor."

For marketing management, consumer associations are becoming a force to reckon with. The clearest evidence is seen in Britain, where the Consumers' Association (CA) has a growing influence on manufacturers as well as consumers. And the CA's success is recent enough to have real meaning for consumers' unions now getting underway in a number of nations.

• **Shaky Start**—The CA was organized just three years ago, patterned on—and with the encouragement of—the U.S.A.'s Consumers Union, Inc., which has been going strong for 20 years. But in contrast to its thriving American cousin, the CA's headquarters was in a deserted garage in London's East End. Its founders were hard-pressed to scrape together enough money to buy products for testing, much less pay a staff and put out a quarterly bulletin to consumers.

The founders' dedication carried the first issue of "Which?" through the pangs of publication. They frankly expected it to be the last. In the report were comparative ratings—with brand names—of electric kettles, sunglasses, aspirin, cake mixes, scouring powders.

Then support came from an unexpected source: London newspapers discovered that the new organization made very popular reading. And within two weeks, the CA was flooded with 6,000 applications for membership.

Today, the CA occupies highly respectable quarters in the West End. "Which?" has become a monthly magazine, going to 177,000 members and read by an estimated two million quality-conscious consumers.

• **How Much Influence?**—As a matter of policy, the CA goes out of its way to remain aloof from people "on the commercial side of the fence." (Britain has another organization, the Consumer Advisory Council, that does not: It includes: representative manufacturers, wholesalers, retailers, and consumers.) The CA's governors are mostly from the professions, with a sprinkling of housewives and Members of Parliament.

The CA buys its products for testing direct from retail outlets, with the emphasis on popular, highly-advertised brands. For testing facilities, it looks in the direction of technical colleges and independent laboratories.

Its influence is exerted indirectly. Manufacturers cannot ignore the impact on consumers, let alone retailers, of a monthly report that frankly lists the virtues and defects of competitive products. Some of the products that CA has found unsatisfactory—an allegedly unsafe electric toaster, for instance—are no longer on the market. And CA officials are convinced that its reports have led to improved products and services and, in several instances, to reduced prices.

The CA expects its purchases to be representative of the product; but in cases of exceptionally good or bad performances, it often buys another sample to make sure.

• **Reactions**—Occasionally, letters from manufacturers announce an intention to sue; as yet, however, no legal action has been carried out. The angriest attacks are against the CA's testing methods, which often depend on instrument readings rather than user comments. (Based on this argument, a libel suit was recently filed against the U.S.A.'s Consumer Union by a manufacturer who claims the CU's tests caused a decline in sales. The CU's answer is that it has a right to make objective, "non-user" tests.)

Another criticism: The CA does

THE ELECTRICAL NEEDS OF EVERY INDUSTRY ARE SUPPLIED BY

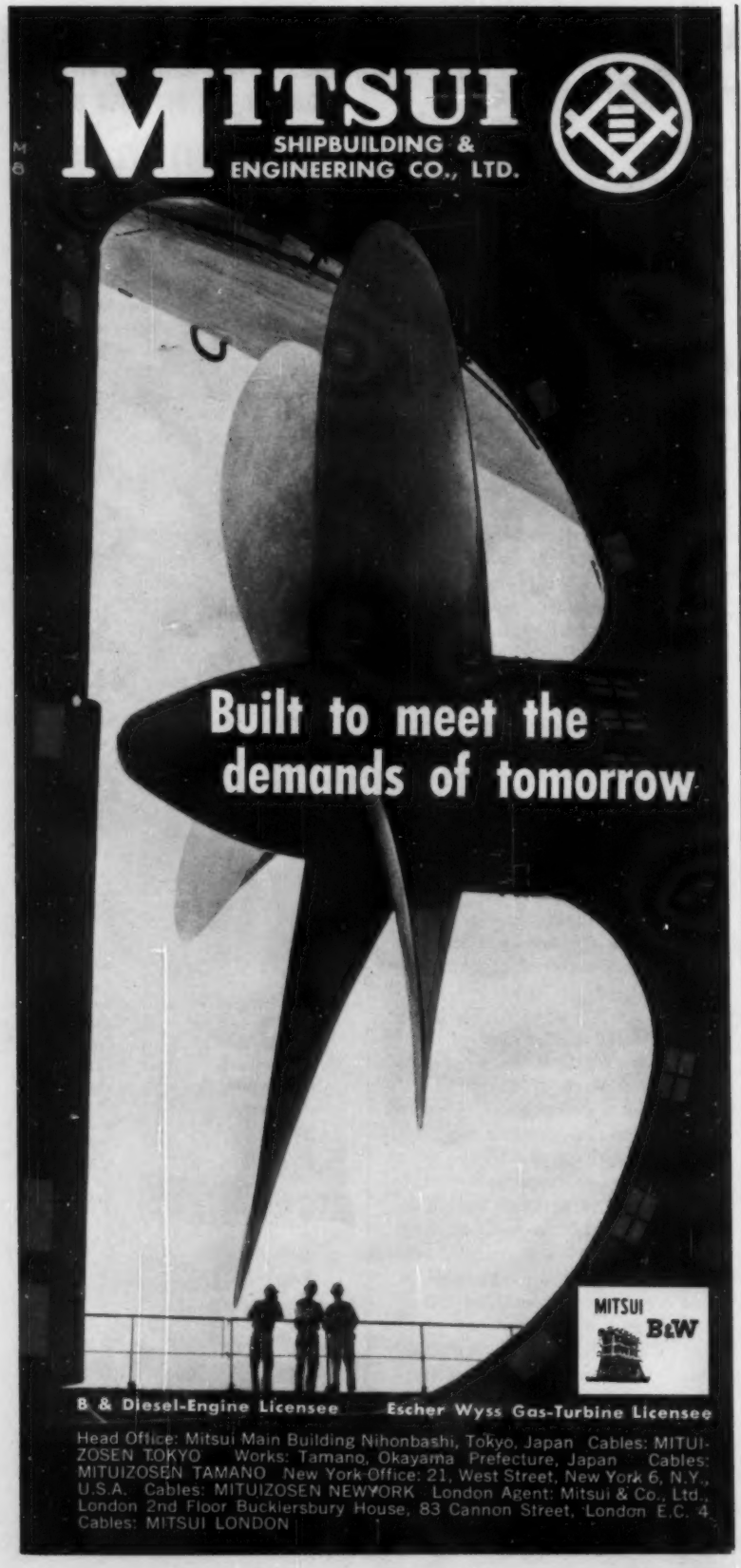
Westinghouse

Constant research, application, experience and organized product development contribute to the advanced design and reliable performance of hundreds of Westinghouse products for improved production in countless industries. For automation, for motivating equipment, for controlled atmosphere, check these typical examples:

CYPAK — tiny plug-in units for the automatic control of a single machine or an entire factory.

LIFE-LINE MOTORS — superior life-guard insulation and Guardistor temperature protection, exclusive Westinghouse features, guaranteed long-life, top performance under all conditions.

AIR CONDITIONING — package units for quickest, simplest installation available in 3 to 50-ton capacities plus custom installation where required.


MITSUI
SHIPBUILDING &
ENGINEERING CO., LTD.
Built to meet the
demands of tomorrow
MITSUI
B&W
B & Diesel-Engine Licensee
Escher Wyss Gas-Turbine Licensee
Head Office: Mitsui Main Building Nihonbashi, Tokyo, Japan Cables: MITUIZOSEN TOKYO Works: Tamano, Okayama Prefecture, Japan Cables: MITUIZOSEN TAMANO New York Office: 21, West Street, New York 6, N.Y., U.S.A. Cables: MITUIZOSEN NEWYORK London Agent: Mitsui & Co., Ltd., London 2nd Floor Bucklersbury House, 83 Cannon Street, London E.C. 4 Cables: MITSUI LONDON

nor—and cannot—consider the importance of personal tastes.

Rating a product high also presents a problem. In their enthusiasm, manufacturers often ask CA permission to use its reports in their advertising. Balked by CA's refusal, one firm ordered and distributed 2,500 copies of "Which?" Now, CA will not sell more than 12 copies to one customer without a guarantee that they will not be used for advertising.

On the whole, the reactions of manufacturers to CA have been surprisingly good.

The CA does ask for a minimum amount of cooperation from them—mainly specifications and details on products it is testing.

• **The Movement**—It isn't cheap to set up a testing organization independent of commercial subsidy. The CA's tests have ranged all the way from $14 (for a report on horse-racing tipsters) to $14,000 (for tests on washing machines). And because of the expense involved, the CA has been one of the strongest advocates of more cooperation between national consumer organizations. It has tested products for the Netherlands' Consumenten Bond and for the Belgian organization. In turn, it has sent British products to be tested in The Netherlands and in the U.S.A. This kind of exchange is still relatively rare, but it could become routine.

In March, the representatives of 16 consumer associations from 14 countries, meeting in The Hague, agreed to establish a new world organization—the International Office of Consumers' Unions. The Office will act as a clearing house for problems, testing methods, and reports on products that move in world trade. An important project will be a directory of independent laboratories around the world—the scarcity of testing facilities is one the biggest problems for consumer organizations.

Once testing procedures are standardized, it will be possible to do cooperative testing on an international scale. As starters, CA officials suggest such products as tires, gasoline, television sets, stockings. As this movement gains, the consumer unions—and the consumers behind them—may become an important factor in international marketing. ●

from Burroughs...

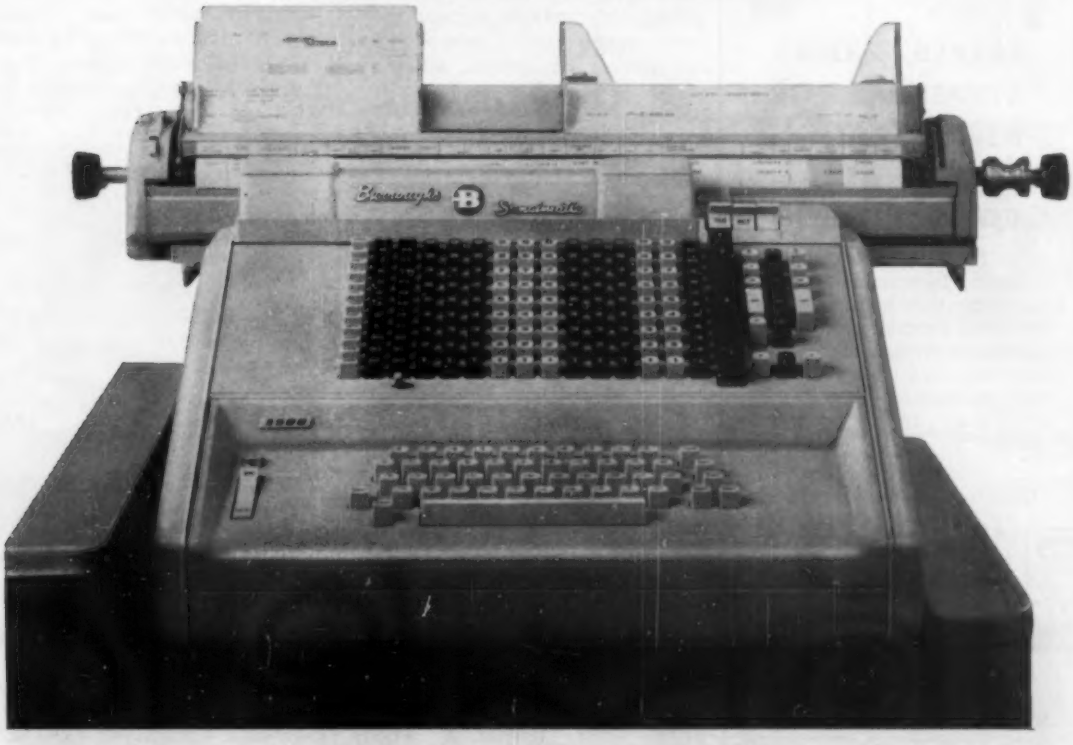
THE NEW TYPING SENSIMATIC

PROVEN BY THOUSANDS OF BUSINESS CONCERNS IN 72 COUNTRIES

In only two years, the Burroughs Typing Sensimatic has gained wide acceptance for many sound reasons

You get up-to-the-minute information to aid management in business decisions without costly delays . . . you get unlimited accounting programming with the machine adapted to your system. Each modern Sensimatic control unit can be programmed to perform four different accounting functions with the turn of a knob, thereby eliminating: (1) storage of control bars, (2) damage to bars in handling, and (3) time in locating and changing control bars. Additional control units for the same machine are available. There is a Typing Sensimatic model to fit your exact accounting requirements. Operating simplicity minimizes the cost of operator training time.

There is much more to the Burroughs Typing Sensimatic success story . . . most of all, we'd like to remind you that the Sensimatic, like *every* Burroughs product, is specifically designed to help you do a more business-like job faster, more efficiently and at less cost.



Burroughs

CALL YOUR BURROUGHS MAN

The Burroughs representative in your locality is always available to discuss with you the latest accounting techniques . . . and to help you adapt Burroughs complete line of equipment to your present as well as future needs. For his address, consult your directory or write: Burroughs Corporation, International Division, Detroit 32, Michigan, U.S.A.

VALVES, DRIERS, STRAINERS FOR REFRIGERATION AND AIR CONDITIONING

Since 1914 Henry air conditioning and refrigeration valves and accessories have been recognized for their complete on-the-job satisfaction throughout the world. Available in a wide variety of sizes and types for refrigerants 12 and 22, etc. and for ammonia service.

Write for latest catalogs and prices.

HENRY VALVE CO.

3223 North Avenue,
Melrose Park, Illinois
(Chicago Suburb) U.S.A.
Cable: HEVALCO,
Melrose Park, Illinois

VALVES, DRIERS, STRAINERS, AND ACCESSORIES FOR REFRIGERATION, AIR-CONDITIONING, AND INDUSTRIAL APPLICATIONS

French Join Forces for More

RAOUL de VITRY d'AVAUCOURT, president of Pechiney since 1936, chairman since 1958, played a key role in developing West African aluminum production and in guiding the Fifth Republic's economic reforms. Pechiney's 1959 sales: $152.4-million, not counting excise taxes. Products: aluminum (58% of sales); rare metals; nuclear materials, electro-metallurgical products; derivatives of sodium, ammonia, sulfur, copper, fluorine.

MARCEL BO, chairman of Rhone-Poulenc, has been with the company since 1918. He is highly research-conscious, and is convinced that the key to the company's success lies in a variety of radically new products. Rhone-Poulenc's 1959 sales (including two affiliates, Specia and Prolabo): $170.7-million, counting excise taxes. Products: pharmaceuticals (35%); plastics (30%); industrial chemicals, agricultural products, perfumes.

ARNAUD DE VOGUE has been St. Gobain's chairman and president since 1952. He engineered St. Gobain's entry into the U. S. glass market and is largely responsible for the company's rapid expansion since 1952. St. Gobain's 1959 sales (including wholly owned subsidiaries): $181.8-million, not counting excise taxes. Products: glass (50%); fertilizers; acids; plastics; paper; nuclear products; organic chemicals.

JEAN-JACQUES DESPORTES, president of Etab. Kuhlmann, avoids publicity but is considered one of the industry's most talented executives. He joined Kuhlmann in 1945, became a director in 1957, and has concentrated on diversification in chemicals. Kuhlmann's 1959 sales: $109.1-million, including excise taxes. Principal products: fertilizers; heavy chemicals. Its affiliates make dyestuffs; methanol; oxo alcohol; ethylene oxides; plastics.

Chemicals

A STRIKING FEATURE of the French chemical industry is its fragmentation into hundreds of small enterprises, each with a tiny share of the market. But the fragmentation is misleading, and mostly a matter of bookkeeping.

The Big Four of French chemicals—Pechiney, St. Gobain, Rhone-Poulenc, Kuhlmann—indirectly control much of the industry. Their chief executives (pictures, left) are the men who have inspired the rapid post-war expansion of French chemicals. And they are the men who today are seeking new means —large-scale production, rationalization, joint ventures, diversification—to maintain growth in the face of tomorrow's political and economic problems.

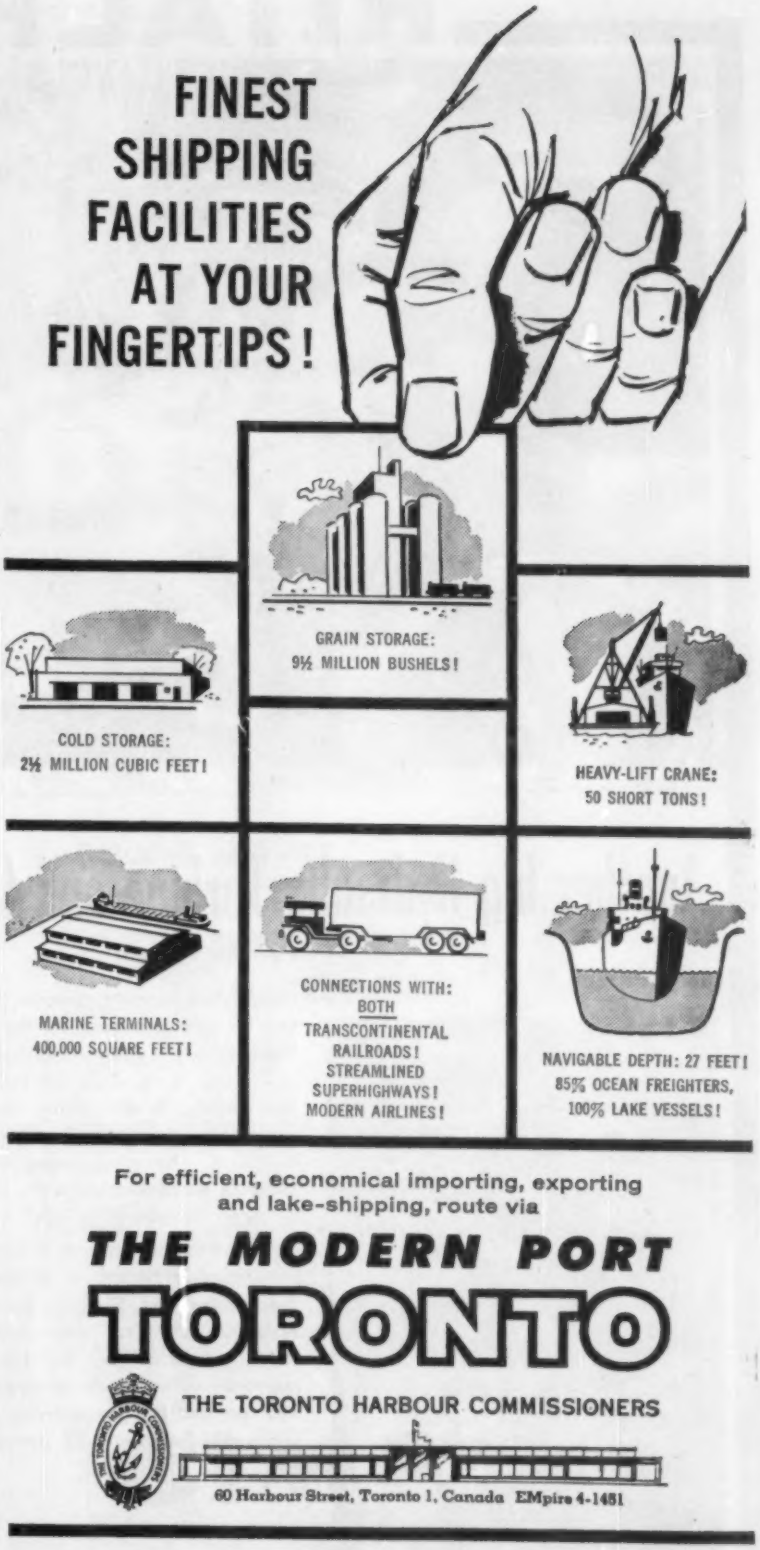
The industry's structure is misleading because the companies normally do not consolidate the sales of their numerous affiliates. If Pechiney were to include the figures of its affiliates, sales for 1959 would total more than $300-million, instead of the $152-million listed. Kuhlmann's sales would be about $202-million, rather than $109-million.

• **Rapid Growth**—Today France ranks as the world's fifth largest producer of chemicals, after the U.S., the U.S.S.R., West Germany, and Britain. It is the fourth largest exporter, ahead of the U.S.S.R.

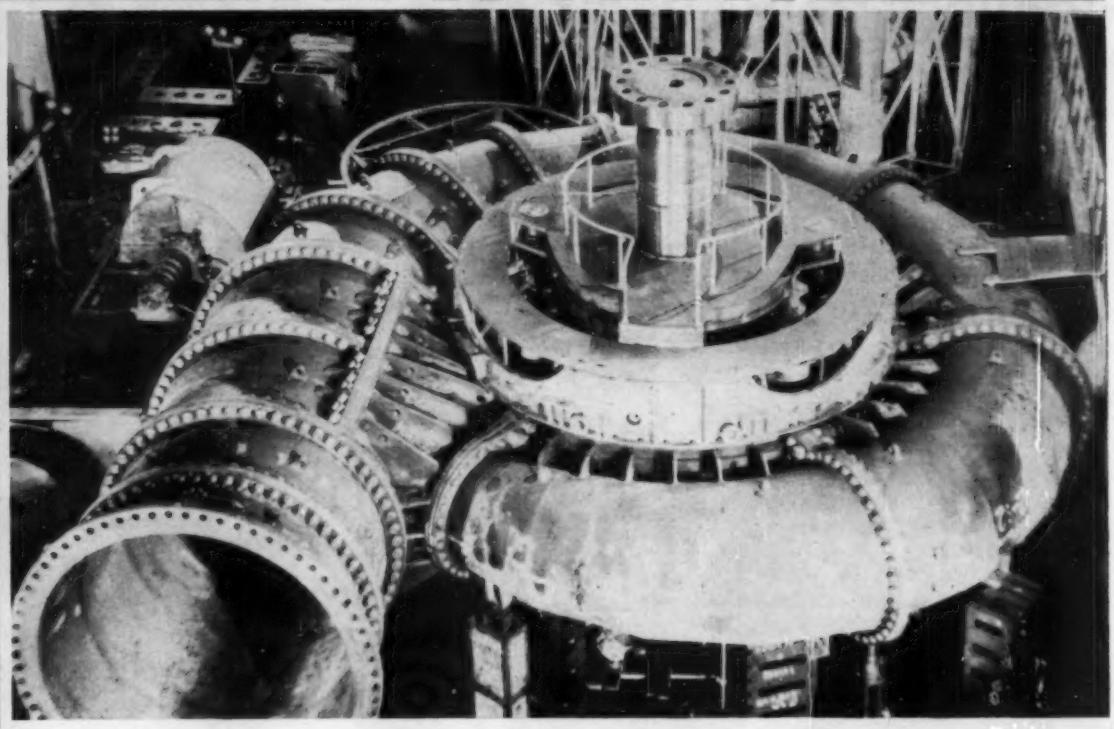
By the end of 1959, production of many chemicals had already surpassed the 1961 goals of the Third Modernization and Equipment Plan. Annual output of sulfuric acid came to 1.8-million tons—52% more than in 1952. Calcium carbide was up 52%, to 344,000 tons; caustic soda, 18%, to 750,000 tons. And many new products had been introduced.

• **Problems Ahead**—France's Big Four now are bending all efforts to maintain this dynamic growth. The chemical industry itself was never stronger, but its fortunes are dependent on more complex national and international events.

Economically, France appears to be on solid ground. The de Gaulle government's stabilization program has slowed the drain on foreign reserves, which brought the coun-


FINEST SHIPPING FACILITIES AT YOUR FINGERTIPS!
GRAIN STORAGE: 9½ MILLION BUSHELS!
COLD STORAGE: 2½ MILLION CUBIC FEET!
HEAVY-LIFT CRANE: 50 SHORT TONS!
MARINE TERMINALS: 400,000 SQUARE FEET!
CONNECTIONS WITH: BOTH TRANSCONTINENTAL RAILROADS! STREAMLINED SUPERHIGHWAYS! MODERN AIRLINES!
NAVIGABLE DEPTH: 27 FEET! 85% OCEAN FREIGHTERS, 100% LAKE VESSELS!
For efficient, economical importing, exporting and lake-shipping, route via
THE MODERN PORT
TORONTO
THE TORONTO HARBOUR COMMISSIONERS
60 Harbour Street, Toronto 1, Canada EMpire 4-1481

HITACHI



Another big Hydraulic Turbine and Generator by Hitachi

Hitachi has recently completed two 137,500kw/125,000kVA hydraulic turbines and generators for the Miboro Power Station in Central Japan. The turbine is of the vertical-shaft Francis type, and specified for a speed of 225 rpm, a maximum effective head of 200 m and 76.6 cu.m/sec water flow, making it one of the largest units of its kind in the world. Its runner has a maximum diameter of 3.7 m and the main shaft a diameter of 95 cm. The spiral casing, which was constructed in 13 sections to facilitate transportation to the site, has an inlet diameter of 3.35 m and an outer diameter of 11.2 m.

The generator presents a high-torsoed appearance as shown in the photograph, having been so designed in consideration of the comparatively high speed. Since the generator was designed for a rated voltage of 16,500 volts and, in this respect, represents the first such attempt in Japan, particular care was taken in the corona-shielding and impulse resistance of the stator winding. The generator is rated at 60 cycles, 225 rpm and 0.9 power factor but is also capable of operating at 50 cycles, 187.5 rpm and 1.0 power factor.

Hitachi, Ltd.
Tokyo Japan

Por Cable : "HITACHY" TOKYO

try close to bankruptcy two years ago. A new competitive elan is growing among businessmen.

Yet the picture is not entirely satisfactory. The Algerian war appears far from settlement, and it is costing France over $1,000-million a year. Experts believe that the French economy can not continue indefinitely along this line without again getting into foreign exchange difficulty, which—compounded by inflation—could hamper industrial expansion.

• **Continental Planning**—Despite these uncertainties, French chemical leaders are optimistic. You hear some observers stressing the need to think on a continental and international, rather than a national, basis. They say that France's chemical industry—and its other industries—must plan more in terms of the Common Market than in terms of one nation's ups and downs.

France's chemical Big Four see the need for further concentration of their industry if they are to meet the competition that will intensify as tariff walls drop within Europe. Some of this is simply a matter of tightening up corporate structure. Pechiney recently absorbed two of its affiliates, Terres Rares and Ribecourt. Kuhlmann took over its affiliate Coignet.

• **Joint Ventures**—In other cases, the program means joint ventures, linking French chemical companies with each other and with outside interests. Pechiney, Rhone-Poulenc, and Kuhlmann have teamed up with Ugine and with petroleum and rubber companies to make butyl rubber. Pechiney, Rhone-Poulenc and St. Gobain—again with Ugine—have formed the Societe des Resines Fluorees to produce tetrafluoroethylene. Pechiney and St. Gobain are partners in Produits du Titane, a producer of titanium oxide.

Joint ventures with foreign companies also are increasing. France's first GRS synthetic rubber plant, due to start up next year, will see St. Gobain allied with Royal Dutch/Shell, Godfrey L. Cabot of the U.S.A., and others. (Cabot, incidentally, is just one of a number of U.S. companies—Dow, Continental Carbon, United Carbon, Wyeth, among them—which have launched new operations in France or expanded old ones in the last year.)

Pechiney and St. Gobain last year set up the biggest joint venture of them all, Produits Chimiques Pechiney-St. Gobain. The new company—with sales for this year estimated at $140- to $160-million—merges most of the two companies' domestic chemical activities excluding petrochemicals and St. Gobain's soda operations.

• **First in Petrochemicals**—Petroleum from the Sahara will help France dominate raw-material supply for the Common Market's petrochemical industry. French companies plan to spend $225-million in investments between 1959 and '61.

The petrochemical complex going up in Lacq field is a dramatic example of how French companies are joining forces. Five jointly-owned companies are now building plants for producing eight products. The complex will have a capacity larger than any single French company.

Key company of the complex is Aquitaine Chimie, owned by Pechiney, St. Gobain, Pierrefitte, Office Nat. Ind. de l'Azote, and a bank. (*Chemical Week, May 7, p21*)

INDOORS AND OUT
THIS IS THE HUNGRIEST
SWEEPING MACHINE
MADE TODAY!

DESIGNED especially for use where there is no power available and petrol engines cannot be used, the latest Battery-Operated 'BLUE BIRD' (MK. V.) Vacuum Sweeper is driven quietly by 24 volts (twin 12 volt batteries), giving 8 hours continuous operation. The brush is in two halves each separately geared to the wheels. It consists of 24 segments for easy removal and is adjustable to take up wear. Average life of the brush is 9 to 12 months and the saving in brooms and brushes more than defrays the total cost of the machine.

CIMEX

BLUE BIRD (VACUUM) SWEEPING MACHINE

Please write for details to:
CIMEX LIMITED
75-97 CRAY AVENUE · ORPINGTON · KENT · ENGLAND
Tel: Orpington 26731

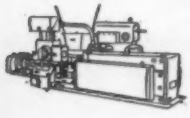
CIMEX THE WIDEST RANGE OF FLOOR CLEANING MACHINES IN THE WORLD CIMEX

Where Performance Counts

WALLACE & TIERNAN EQUIPMENT IS USED

CHLORINATION

The W&T high capacity chlorinator shown above at a steam generating plant is used for chlorination of cooling water to eliminate slime formation on condenser water-side surfaces. The W&T chlorinator was chosen because of its accuracy, dependability, and simplicity of operation. These qualities are typical of Wallace & Tiernan's complete line of chlorination equipment which is widely used both in industry and in the protection of public water supplies.



PROCESS FLOW CONTROL

Equipment includes chemical solution feeders, gravimetric and volumetric dry feeders, and gravimetric meters for use in the chemical, grain, and food processing industries.

AIDS TO NAVIGATION

Includes a number of protective devices for navigation such as buoys, lamp changers, flasher mechanisms, signal timers, fog horns, aircraft flasher units and other related apparatus designed for use in the marine and air transportation field.

PRESSURE SENSITIVE INSTRUMENTS

Equipment includes a complete line of aneroid and mercurial pressure sensitive instruments, such as altimeters, barometers, and manometers designed for use in industrial testing as well as for research purposes.

Other quality Wallace & Tiernan products and services used throughout the world are listed below. For further information send for list number F-106 of available free technical publications on all Wallace & Tiernan products.

Ammonia Control Apparatus — Cathodic Protection Systems — Chemical Feeders — Chlorinators — Decay Control Process for Produce — Electric Marine Beacons — Flour Processing Chemicals — Pharmaceuticals — Precision Instruments

WALLACE & TIERNAN INCORPORATED

25 MAIN STREET, BELLEVILLE 9, NEW JERSEY, U.S.A.

REPRESENTED IN MOST COUNTRIES

F-106

● PRODUCT DIGEST

Plastic Coating Protects Glass

A new plastic coating can be sprayed or brushed on glass containers to protect laboratory workers and experimenters in the event of breakage or explosion. When the glass breaks, the plastic remains intact and acts as a bag for the contents. It resists nearly all chemicals long enough for them to be recovered, so that there is the least possible loss or waste. Also, the coating is said to increase the resistance of glass to breakage.

Other suggested uses: protecting vacuum systems; sealing joints; reinforcing equipment handles; coating tongs and clamp rings. *Ace Glass Inc., Vineland, N. J., U.S.A.*

Automatic Prepackaging of Supermarket Foods

A simple digital computer is the heart of an electronic weighing system for prepackaging grocery goods. Enclosed in a single housing, the machine—called "Valuematic"—weighs an item to the

continued on p 34

5 Euclids at British Power Station

The Southern Project Group of Britain's Central Electricity Generating Board is using two Model TC-12 Crawler Tractors and three "Euc" Scrapers at the new Northfleet Power Station. These five machines will stockpile and reclaim coal and will handle the disposal of pulverised fuel dust and bottom ash.

One of Europe's largest coal burning type stations, Northfleet will consume approximately one and three quarter million tons of coal annually — at peak capacity it will generate 720 M.W. In order to accurately determine hourly production of the 425 h.p. Euclid Crawler with standard 22 foot coal blade, tests were recently carried out over carefully measured distances and grades. Working from a stacker conveyor, the tractor handled 525 tons per hour on adverse grades of 20% and 200 feet dozing distance. When reclaiming from the stockpile into a ground hopper, the TC-12 moved 970 tons per hour on a 3.5% grade for 200 feet. On level dozing, more than 1,000 tons per hour were reclaimed.

The three Euclid Scrapers are handling bottom ash and pulverised fuel at a rate of approximately 12,000 tons per week. This material is moved to a disposal area where it is layered, compacted and graded to minimize dust nuisance to local housing in the vicinity.

If your operations require the use of heavy equipment for stockpiling, mining, quarrying or heavy earthmoving, it will pay you to check the complete line of Euclid Rear-Dump and Bottom-Dump Haulers, Crawler Tractors and Scrapers. The Euclid Dealer in your area will be glad to provide helpful facts and figures.

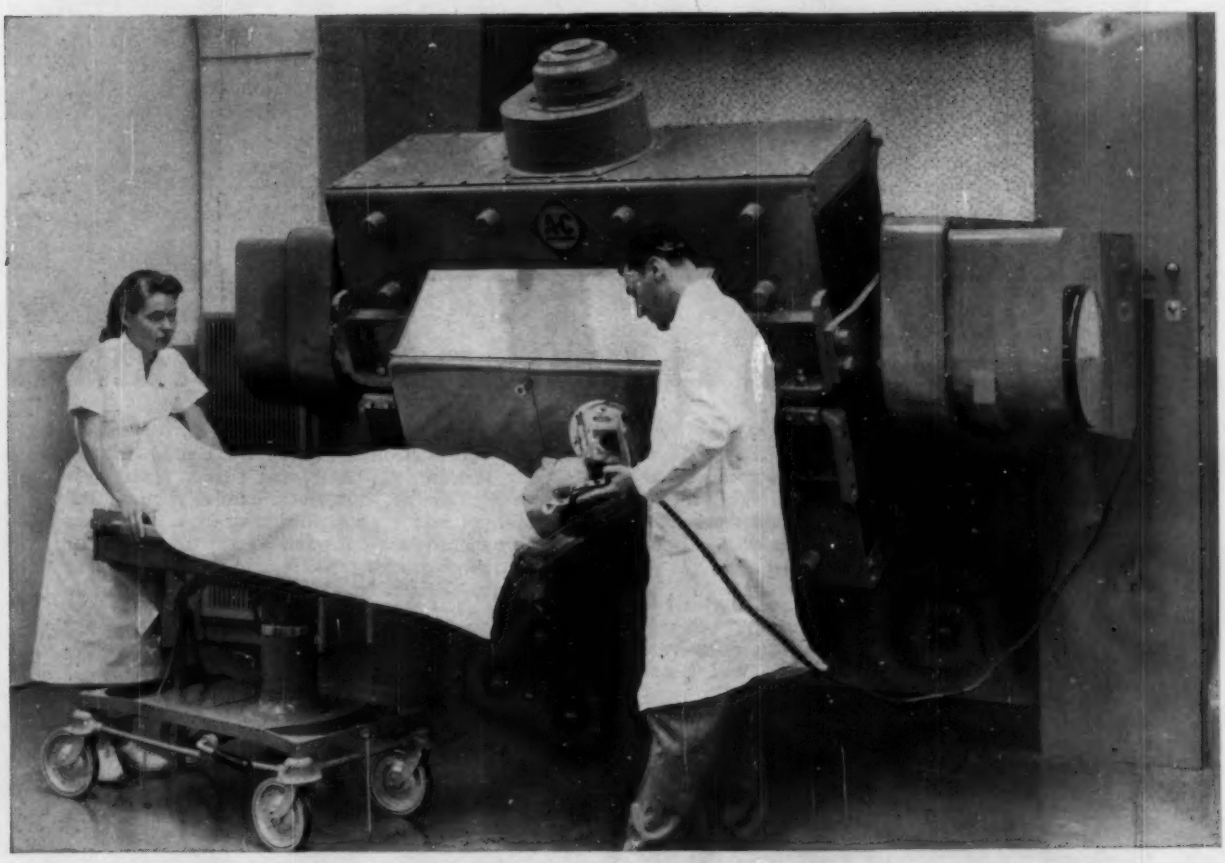
GENERAL MOTORS OVERSEAS OPERATIONS • 1775 Broadway, New York 19, N. Y., U. S. A.
EUCLID (GREAT BRITAIN) LIMITED • Newhouse, Lanarkshire, Scotland

EUCLID PRODUCTS

Allis-Chalmers

NEWS AND VIEWS OF THE WORLD AT WORK

Madison, Wisconsin, U.S.A.: This Allis-Chalmers 25-million volt betatron serves a dual purpose. During the day it is used for medical therapy for patients at a privately owned clinic. At night, this versatile unit is assigned to testing and inspection work on a variety of industrial materials. Its activities range from medical therapy to radiographic study of castings and forgings. Its 25-million volt capacity permits X-raying of 10-inch sections of steel in 4 minutes.



Through overseas factories and license agreements with manufacturers abroad, Allis-Chalmers basic machinery for major industries is available in leading world currencies... Allis-Chalmers International, Milwaukee 1, U. S. A.

ALLIS-CHALMERS

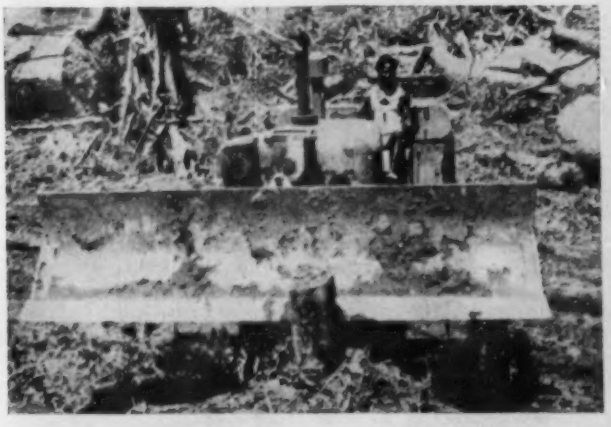
Serving industrial advancement around the world

MINING • MANUFACTURING • ELECTRIC POWER • CONSTRUCTION •

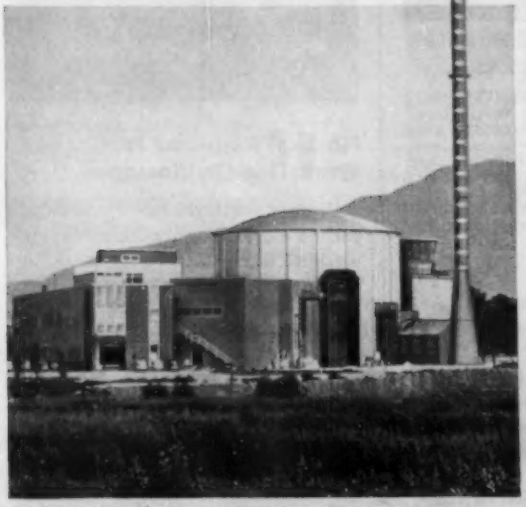
Following completion last year of a modern engineering, development and research laboratory at its Harvey (Illinois) Works, Allis-Chalmers now has under construction a multi-million-dollar addition to existing manufacturing facilities at this plant. With 515,000 square feet of floor space, the new plant will make possible greatly expanded production of the extensive Allis-Chalmers line of diesel, petrol, natural and liquified petroleum gas engines, and material handling equipment manufactured at the Harvey Works.

Perched above the Duero River on the Spanish-Portuguese border, this aggregate plant for the Salto de Aldeadavela Dam began production in December. A Jaw Crusher and a Gyratory Crusher built in the United States by Allis-Chalmers and 12 vibrating screens built at the Allis-Chalmers plant in England handle major processing operations. This equipment is producing aggregate for use in more than 1,000,000 cu yd of concrete that will be required for the dam. The dam will provide much-needed power for a large area of northwestern Spain.

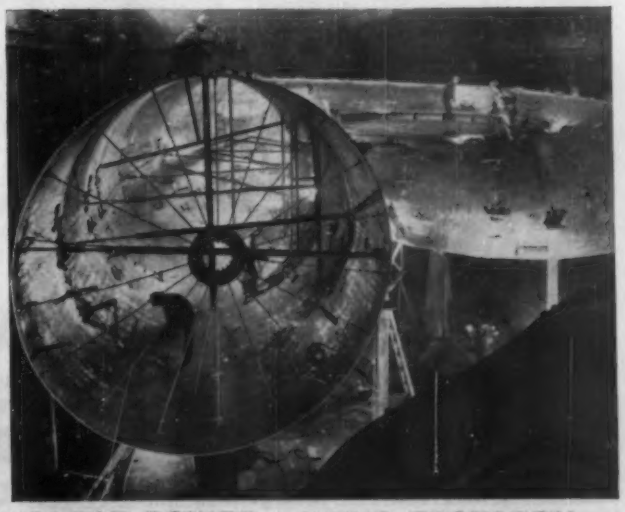
Land clearing on the Ivory Coast of French West Africa is efficiently and economically handled by giant Allis-Chalmers crawler tractors. With an HD-21, this native operator can rip out old tree stumps and doze them out of the way in one quick pass. The easy-handling qualities of Allis-Chalmers tractors mean peak operator efficiency.



Euratom's first reactor, designed and built for Italy's Comitato Nazionale per le Ricerche Nucleari, is the first step in a billion-dollar, 10-year program designed to speed the development of nuclear power in Europe. Located near Ispra, Italy, this Allis-Chalmers 5,000-kw reactor is now leased to Euratom for research work.



A reversible pump-turbine unit (similar to the one shown below) is being built by Allis-Chalmers for the Chubu Electric Power Co. of Nagoya, Japan. The unit, when completed, will be capable of delivering 1,600 cu ft of water per second and will be rated at 60,000 hp. The pump-turbine will be installed at Hatanagi generating plant and will service the Nagoya area.



AGRICULTURE • PUBLIC WORKS • NUCLEAR POWER • BASIC RESEARCH

WORLD
YALE & TOWNE
REPORT

EGGS SEEM UNBREAKABLE WHEN YALE ELECTRIC LIFT TRUCKS WORK THE DOCKS

ST. NINIAN, SCOTLAND—Yale electric trucks, proved for heavy duty handling, are equally effective with fragile fresh eggs. With smooth inching control and steady lifting abilities, these trucks safely handle eighty million eggs a year here in Scotland. Yale electric trucks assure you of more profitable operations on the docks or in your plant because of their long life, dependability and low operating cost.

SAVING WORK WITH YALE WORKSAVERS IN BOOMING BRITISH INDUSTRY

ENGLAND—A major manufacturer of dry batteries and portable radios knows the value of saving space and time in handling zinc supplies. By using Yale fork lift Worksavers, he gets big truck performance at small truck cost. Yale Worksavers, available in pallet, platform, fork lift and tractor models are especially suited for short hauls and low load floors and platforms.

WORK LOADS FLOW FASTER WITH FLUID COUPLING YALE PETROL TRUCKS

CALIFORNIA, U.S.A.—This Yale fluid coupling petrol truck easily moves large crates in warehouse. These trucks were selected for their space-saving maneuverability and power. Easy to maintain, they assure you of a minimum of costly downtime. Yale petrol trucks are built in a wide range of capacities to withstand rugged treatment—for years of dependable service.

- Yale makes the world's most complete line of petrol, LP-gas, electric, diesel and hand lift trucks.
- All Yale industrial lift trucks are uniformly high in quality, wherever manufactured.
- All Yale equipment available in currencies of the free world.
- For further information contact your Yale sales and service representative—located in principal cities of the world.

YALE®
INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS
YALE & TOWNE

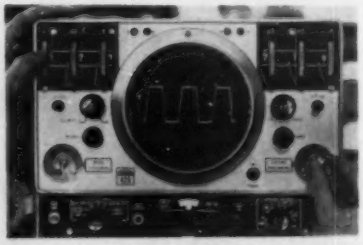
The Yale & Towne Manufacturing Company, Chrysler Building, New York, U.S.A.
Manufacturing Plants: Velbert Rhld., Germany • Wednesfield Staffs, England • Phila., Pa., U.S.A.
Licensed Manufacturer: Fenwick—Saint-Ouen, Seine, France • Milan, Italy • Barcelona, Spain

nearest ½-gram, computes its price, then prints and delivers a label with this information—all in about a second. To safeguard the system against any mistake by the operator, there are signal lights and automatic locks.

The Valuematic can handle 30 packages or more a minute; the maker estimates that it will do the same amount of work as two men working with present prepackaging equipment in a high-volume supermarket. Eventually, it hopes to market the machine for industrial applications as well. *Toledo Scale Corp., Toledo* 12, *Ohio, U.S.A.*

Typewriter "Senses" Lines on Forms

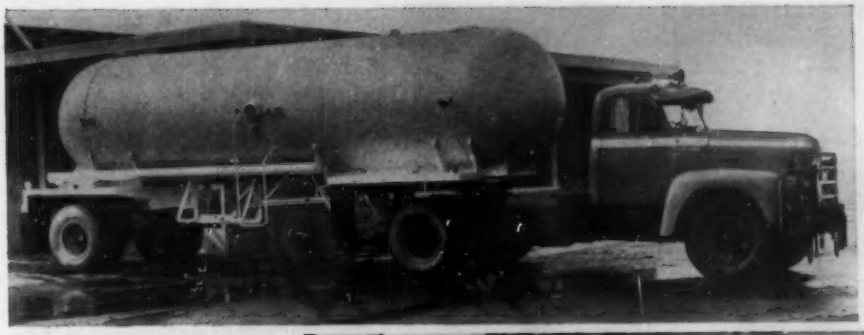
Horizontal and vertical tabulating on forms is controlled automatically by a new typewriter, the Royal Spacetronic. The machine has a photo-electric sensing device that "sees" ordinary printed columns on a form or document and controls tabulation automatically, thus doing away with the need for tabular stops. The machine can be used on different kinds of forms with no extra adjustment, since the electronic eye automatically senses the format of each document and makes the correct stops. *Royal McBee Corp., Westchester Ave., Portchester, N. Y., U.S.A.*



No Skill Required to Work This Oscilloscope

A new cathode-ray oscilloscope can be worked by unskilled factory workers, according to its manufacturers. The scope indicates directly in digits the peak-to-peak voltages, instantaneous voltages, and rise time of motors, capacitors, and rectifiers. Thumbscrews set the position of the dots on the waveform. Digital analysis of the curve can then be read from the dials by an unskilled production line worker.

The company estimates that



CALGARY STEEL TANK, LIMITED
CALGARY, ALBERTA

Canada's leading makers of LPG highway transport tank trucks find use of USS "T-1" Steel permits great weight savings, so that a lighter, less costly unit is possible.

DOMINION BRIDGE COMPANY, LIMITED
CALGARY, ALBERTA

SPARLING TANK & MFG. CO.
TORONTO, ONTARIO

PAYLOAD UP . . . OPERATION COSTS DOWN!

Tanks made of USS "T-1" Steel

Choice of "T-1" Steel for these units is significant. USS "T-1" Constructional Alloy Steel has a minimum yield strength of 100,000 psi, permitting design to high working stresses. Taking advantage of the strength and weldability of "T-1" Steel allows great increase in payload.

Its high ultimate strength of 115,000 psi minimum encourages design for the greatest payload without exceeding legal highway load limits. Cases have been recorded of payload increases up to 34%. Local conditions may permit even larger gallonage and savings.

Where ASME Code Regulations apply, the most recent revision, Case 1204-4, permits an increase in the allowable stress value to 28,750 psi for USS "T-1" Steel. This results in a further weight reduction of 9.5% over that provided by the previous ASME ruling in Code Case 1204-3.

For the complete story on USS "T-1" Steel, write United States Steel Export Company.

USS and "T-1" are registered trademarks

United States Steel Export Company

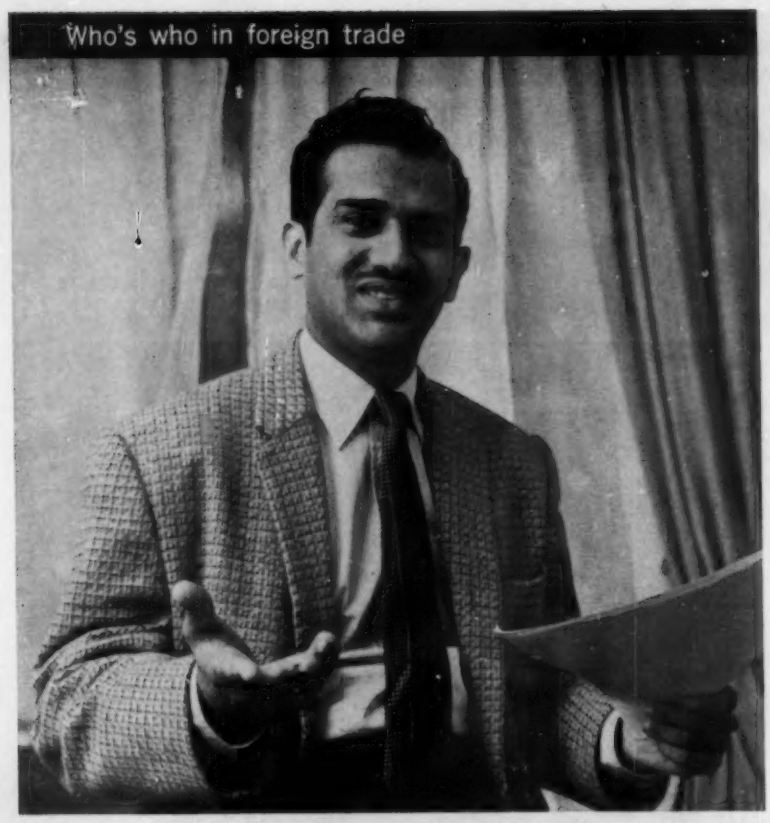
100 Church Street, New York 8, N. Y., U. S. A.

AND FOR THIS HANDY BOOKLET ON THE WELDING OF "T-1" STEEL, WITH POCKET CALCULATOR, RETURN COUPON.

United States Steel Export Company
100 Church Street
New York 8, N. Y.

Gentlemen:
Please send me_____copies of your new 24-page booklet, "How to Weld USS 'T-1' Steel," including the handy heat input calculator.

Name_____
Title_____
Address_____
Company_____
City_____ Country_____



"Our business has expanded with Mitsui's help!"

says HASNAIN A. JAFFERJEE, *Partner,*
Abdulhusein Jafferjee, Colombo, Ceylon

"We deal in textiles. When we want new products, we call Mitsui. Their cooperation has been a big factor in the continued growth of our business."

Ships or sealing wax. All the great variety of quality products now produced in Japan are available through this big trading company. With Mitsui financing, suppliers complete manufacturing schedules on time, with Mitsui supervising quality from start to finish.

Global trading network. Mitsui Offices are in 53 trading centers of the world and affiliated companies in 13 others, a total of 66 cities. These local offices handle your inquiries speedily, efficiently—and you save cable and overseas telephone tolls.

You pay no more. Mitsui assumes all responsibility, handles all claims. Yet, quotations are the same as buying direct. To see how smoothly foreign trade transactions can really go, call Mitsui next time.

the world trades with Japan through MITSUI

MITSUI BUSSAN KAISHA, LTD. (MITSUI & CO., LTD.)
Tokyo, Japan *Cables: MITSUI TOKYO*

about 40% of operational time for a scope is cut by the direct readout system. It foresees wide use in electronics, laboratory work, medicine, nucleonics, radar. *Allen B. DuMont Labs. Inc., Clifton, N. J., U.S.A.*

High-Output Batteries

A new line of high-current silver and copper chloride batteries—primary and secondary, self-activating, and rechargeable—are said to deliver peak currents on the order of 1.6 amp/sq cm. The company also says the batteries will stand short-circuiting for an extended period of time and recover full potential rapidly. *Three Point One Four Corp., Yonkers, N. Y., U.S.A.*

Erases Typing Errors

As first-aid for typists, a German company has developed a chemically-treated paper that makes typewriter erasures easy.

The typist who strikes a wrong letter simply backspaces to the point of error, slips the small sheet of paper over it, and retypes the error. This erases the offending letter or word and leaves a space for the correction. *Tipp-Ex Vertrieb, Frankfurt, West Germany.*

Automatic Yarn Winder

A new development in automated textile machinery is the Uniconer, a machine that is claimed to wind cotton and other spun yarns from spinning bobbins to cones at a speed of about 1,000 meters a minute. The machine has an automatic knot-tying device that minimizes downtime. *Leesona Corp., P.O. Box* 1605, *Providence, R. I., U.S.A.*

In Brief . . .

Automat model construction kits allow apprentices and technicians (as well as young boys) to study different mechanisms, from gear trains to automatic machines. *Automat & Precision Engines Ltd., Limmatquai* 120, *Zurich* 1, *Switzerland* . . . Three-cylinder flame-proof diesel engine for mines tractors is latest from *Perkins Engines Ltd., Peterborough, Lancs., England.*

Losing control?

When transport gets out of hand—profits slip through your fingers. By installing Pye Mobile Radio Telephones its efficiency can be doubled and running costs halved. Hundreds of companies have proved it.

For full information, write your name and address in the margin of this advertisement and post it to us.

Mobile Radio Telephone

PYE TELECOMMUNICATIONS LIMITED, CAMBRIDGE, ENGLAND

Who Should Head Wickersham

The scene: The president's office of Wickersham Mills, somewhere in New England, U.S.A. The area was once a thriving textile center, but now most mills have moved to lower-wage areas in the South. The president's chair is empty, out of respect for David Wickersham, recently deceased.

The cast:

Stockholders:
- ALFRED WICKERSHAM, elder son of the late president. Age: 45. Profession: chief design engineer for a textile machinery company.
- DAVID WICKERSHAM, Jr., younger son of the late president. Age: 43. Profession: sales manager for an electrical company.
- BENJAMIN HALL, cousin of the Wickershams. Age: 46. Profession: management consultant.
- CHARLES HALL, Benjamin's younger brother. Age: 42. Profession: Banker.

Members of the Wickersham and Hall families.

Dr. WILLIS B. MORGAN, professor of business administration, who has been asked to preside over the meeting.

PROF. MORGAN: Let me make it clear that I am here not as an expert in the textile business but as a moderator of this election.

You are here to decide what to do with the Wickersham Mills. Each of the principal stockholders —Charles, Benjamin, Alfred, and David—will express his views on this basic problem. From this group, you will elect a new president to succeed the fine man you so recently lost.

I would ask each of you young men to be quite frank in expressing your philosophy of business. What is Wickersham Mills in business for? If you were president, what would your aims be?

As I understand it, the first mill was established here about 1848, through the imagination and drive of Alfred Wickersham, or "Old Alfred," as you call him. When he was elected Governor in 1870, his son, Benjamin, became manager; but until his death Old Alfred was a dynamic force in the business.

Control of the business has stayed in the family for over 100 years. As a result of the death of David Sr., each of you young men has an equal interest in the business; yet each of you has an independent position and an outside income. This gives you considerable freedom in deciding what to do. You can keep your company going or you can sell it to another concern. If you decide to keep it on, your objectives should be defined to the stockholders.

Let me add that Wickersham Mills is on the brink of insolvency. It may come back again. I'm sure each of you hopes it will; for not only do you have a sentimental attachment to the business, but you also have an investment that must be protected.

Alfred, will you lead off?

ALFRED WICKERSHAM: As an executive, I found my engineering training quite inadequate, so I have recently been studying the problems of business organizations in general.

I believe this business (or any business, for that matter) is the means of transforming an idea into reality. A business organization is created in the minds of men of imagination, drive, and intelligence. Once created, it seems to have an existence which is independent of those who form it. Wickersham Mills has not changed in essence since its founding; miraculously, it seems to have retained the identity which Old Alfred gave it.

By this I don't mean that an organization never changes. It changes much as an individual changes. Wickersham Mills has changed, too, but it has also survived. And that has been due to the courage and effort of the men who have made up the company.

We at Wickersham Mills have been spinning and weaving fine cotton textiles for four generations. But we cannot continue to do so with an absentee ownership or committee management. The man who runs our company, like Old Alfred, must have a free hand, a personal stake in the profits, and a right to change the policies of the company to whatever extent be believes necessary to make it stronger and more effective.

I am willing to take on the task of re-creating the Wickersham Mills. If you decide you want me, I would require a clear understanding that each of you would give me an option to buy your stock at a price equal to twice its present book value—at any time within the next ten years. Meanwhile I must be free to pledge the credit of the company as I think fit, to determine its dividend policy, to sell the plant and move elsewhere, to change our products here—even to change the type of business.

BENJAMIN HALL: Charles and I belong to the Hall—the non-Wickersham—side of the family. We were brought up to feel a strong sense of kinship and pride for the Wickershams and the mill they ran.

Over the past 22 years I have known intimately more than 100 businesses in my consulting work, and I've become convinced that the days when a business could be run by one man, or even a few men, have gone.

I question whether Old Alfred was really the great man we talk about now. I suspect that if we knew the facts, we would find that the mill ran in spite of him, not because of him.

Now to what I think a business is. A business is a living organism. Management may be the most important part, but the other parts are also essential. Whether the

Mills? (a colloquy)

business does well or poorly depends on all parts functioning together effectively. It takes training, discipline, incentives.

Our problem at the mill is to improve our basic process. We have to convert cotton and synthetic fibers into cloth. But we cannot have expensive machines and labor work frantically one minute on a few small orders, and then loaf along until the next orders come in to cause another crisis.

We shall need other improvements, too. One of the reasons this mill has survived, especially after the erratic days of Old Alfred, was that the first Benjamin spent a lifetime cutting out every needless expense, finding more efficient work methods, installing incentive pay, and giving everyone a feeling of identity with the mill.

An organization is a machine. If it works better than others, it will out-produce its competitors in quantity and quality, and it will achieve its purpose: to survive and grow.

If I should be called on, I'll bet I could save $100,000 the first year! This would get us into the black, and we could go on from there.

CHARLES HALL: To me, Alfred's and Benjamin's views are straight from never-never land. They have looked at this business only from the point of view of those working in it. Don't they realize that no business lives alone, that it is nothing more than what the big world requires it to be?

As a banker, I know what goes on in a lot of other businesses. There are many, many "Wickersham Mills" in operation today, and there is intense competition between them. In fact, there never has been a time when competition has been absent.

Here I should point out that the earned surplus of our mills has dropped from a high of $721,000 at the end of 1951—thanks to Korea—to less than $200,000 right now. We lost a half-million dollars in nine years! It's obvious that David Sr. failed to reckon with the market.

Actually, a business like ours is in many markets. Whether we want raw cotton or synthetic fiber, new machines or labor, or whether we need money, we have to pay the going price or do without. It follows that when we sell we must accept what the market is willing to pay. And our market happens to be especially hard to predict.

Any sentimental attachments we may have for the business should not blind us to the facts of the market. This is a dying industry. No sane investor will put equity into a textile plant in this part of the country unless he wants to buy property for its liquidation value.

I am ready to do what may be necessary to keep the plant going, and to protect your investment until we can dispose of it at the best price we can obtain. I will arrange whatever loans may be needed, but only on a secured basis.

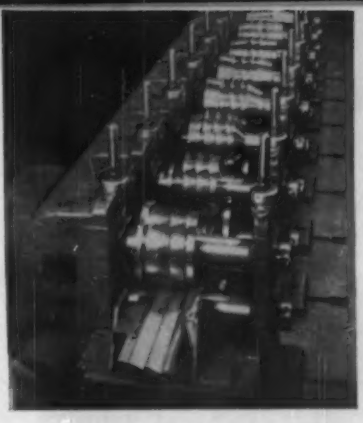
DAVID WICKERSHAM, Jr.: Up to now I have heard no mention of one important word. It sums up for me what Wickersham Mills was founded for, why it has stayed in business, and how it can ever hope to continue. That word is service.

I see a business as a service for somebody else, that is all. It does not matter what the service is so long as it fills some decent human need.

If this business is to continue, it has got to provide the clothes-buying public—or some part of it—with the kind of cloth it wants. And it must provide the people in the organization with the compensation and the sense of accomplishment *they* want.

Nowadays the public wants—and we have the technical skill to make—fabrics in an almost infinite variety. We cannot compete for the plain fabric business with the big companies in the South; so we are confined to making specialty products and fine goods.

Ben mentioned that one of our key problems was scheduling work that would keep all our equipment in use. But this problem is not go-



Yoder Roll-Forming Equipment mass-produces shapes accurately, economically

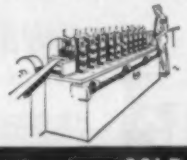
Yoder Roll-Forming Equipment, even with part-time operation, can effect significant savings in many metal working applications and industries. Shapes, simple or complex, can be quickly and economically produced the Yoder way from a wide variety of flat-rolled coated or uncoated stock ... in thickness up to ¾ inch ... in speeds up to 50,000 feet per day.

Yoder engineers flexibility and precision into metal forming operations. For example: many basic shape modifications, such as coiling, welding, notching, ring-forming, perforating, and cutting to length can be simultaneously accomplished with little or no additional labor cost.

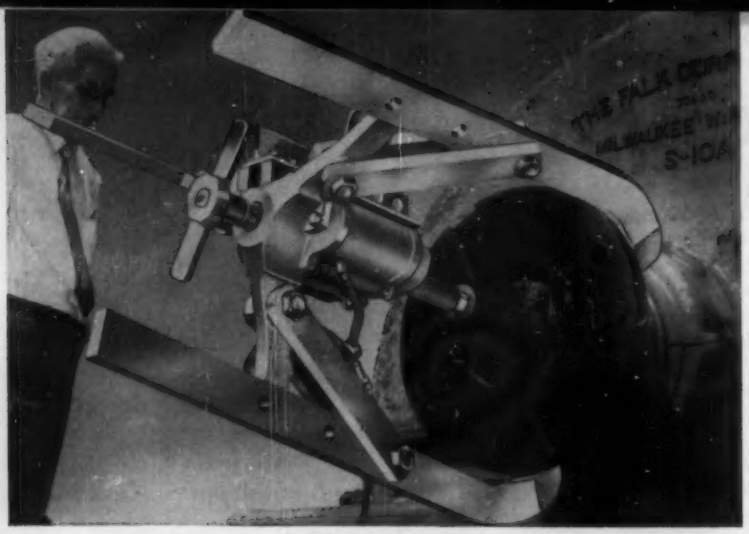
Yoder also makes a complete line of Rotary Slitters and Pipe and Tube Mills. Profit from Yoder's years of engineering and service experience, contact your local Yoder representative or send for the Yoder Roll-Forming Manual.

This fully-illustrated 88-page book clearly discusses every important aspect of Yoder Roll-Forming Equipment and methods ... it's yours for the asking!

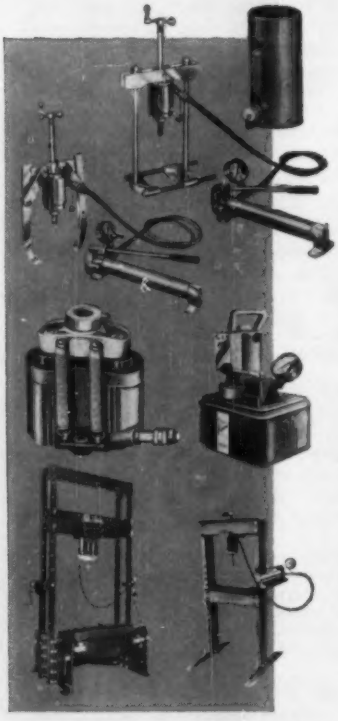
THE YODER COMPANY
5517 Walworth Avenue • Cleveland 1, Ohio



ENGINEERING YODER MANUFACTURING
COLD ROLL FORMING MACHINES



Cut Maintenance Costs with Modern OTC Hydraulic Pulling Equipment



- **REMOVE AND INSTALL GEARS, BEARINGS, WHEELS, PULLEYS QUICKLY AND SAFELY... AND WITHOUT DAMAGE TO PARTS!**

Mr. Executive: As you well know, the elimination of unnecessary maintenance costs and loss of production time due to idle machinery is of vital importance to your entire operation! Solving tough maintenance problems is OTC's specialty! Wherever gears and wheels are turning, the versatile OTC "pulling-system" stands ready to handle the maintenance problems which arise — and handle them quickly, safely and easily without damage or distortion to parts.

Sizes are from 2 to 100 tons. Approval and endorsement by 28 major bearing, tractor and truck manufacturers is your best guarantee of high quality, expert design, long life and complete satisfaction. We cordially invite you to find out more about the time-saving OTC hydraulic "pulling-system."

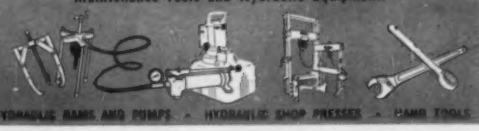
Write for free OTC Industrial Maintenance Equipment Catalog, No. P-9.

RESEARCH · ENGINEERING · DEVELOPMENT

OWATONNA TOOL COMPANY

OWATONNA, MINNESOTA, U.S.A., CABLE ADDRESS: TOOLCO

Designers and manufacturers of the world's most complete line of Maintenance Tools and Hydraulic Equipment.



PULLERS AND PULLER SETS · HYDRAULIC RAMS AND PUMPS · HYDRAULIC SHOP PRESSES · RAMS TOOLS

ing to be solved here at the mill — only where our customers are.

Up to now, we have been relying on two commission houses in New York to take orders and sell our merchandise. I see no reason why we cannot do creative design ourselves. Then, if a customer likes one of our designs, we can work out agreements giving him exclusive use of that design. With enough of these arrangements set up, we could obtain a substantial volume of steady, repeat business. In any event, we must try to serve our customers, perhaps even persuade them to want what we can provide.

PROF. MORGAN: We have just heard four very different philosophies of business. I feel sure that none of these young men believes his approach to management excludes the consideration of opposing views and, when the occasion demands, changing his approach temporarily. In short, I don't think a businessman with common sense ever lets his thinking get completely locked into any one point of view.

I was surprised no one mentioned "profits," a word dear to the hearts of all heirs and stockholders. This indicates, I assume, that we all agree profit is not an end in itself. You want profits, you need profits. But profits for what purpose?

If I may, I'd like to summarize the goals and methods favored by each speaker:

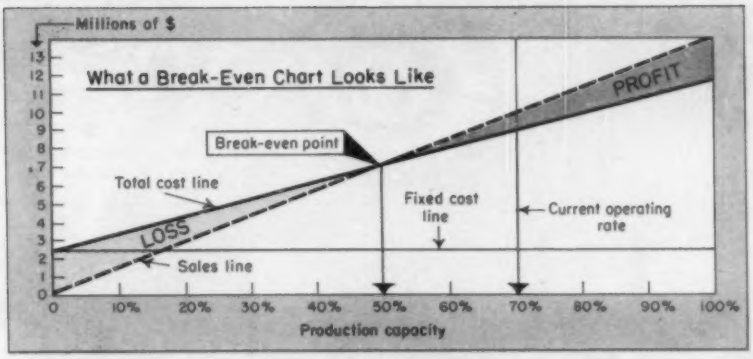
Alfred: His goal is self-realization; his method, imagination, rational choice, will.

Benjamin: His goal is survival and growth. His method, training, discipline, skill.

Charles: His goal is power to predict and control; his method, scientific inquiry.

David: His goal is service; his method, responsiveness, self-transcendence.

Digested from *Harvard Business Review*, May-June, p59 (an article in play form by Abram T. Collier). In a later issue HBR will publish the results of a poll of its readers as to who should be the next president of Wickersham Mills. Meanwhile, INTERNATIONAL MANAGEMENT would be pleased to receive the opinions of its readers. Who should be president—and why?



But Using it is Not Easy

"BREAK-EVEN POINT" is being heard more frequently in management circles these days. It is the point where unit cost equals selling price; or, "the point beyond which, when you go down, you start losing money."

In many nations, executives are talking about the "squeeze" on their profit margins, and the contribution break-even analysis might make in solving their problems. But when interest turns from conversation to application, management quickly learns why the break-even concept—as a guide to business decisions and internal control—is one of the most controversial and hard to use of all business tools and techniques.

Even in well-regulated companies, it is extremely difficult to calculate exactly where the break-even point falls in actual operations. It is necessary to do a fairly precise job of separating fixed and variable costs. Furthermore, if business conditions or prices fluctuate sharply, break-even charts are not only hard to calculate, but lose much of their value.

Still, even rough calculations, if treated with caution, can provide valuable information to management. At the least, management learns the tremendous importance of costs and the basic need for management controls.

• **How It's Done**—The chart above, taken from a recent issue of *Purchasing Week* (May 9, p8), illustrates how break-even points are calculated.

For this company, sales for the period are $10-million, with the plant operating at 70% of production capacity.

The cost figures:

($ million)		
Total Costs	$9.0	
	Fixed	**Variable**
Direct Labor		$2.0
Direct Materials		$3.0
Overhead	$1.0	0.5
Sales	0.6	0.9
Administration ...	0.9	0.1
	$2.5	$6.5

Now, the chart above. The horizontal coordinate is marked off in percentage of production capacity. (In practice, actual units can be used.) The vertical coordinate is taken high enough to cover sales at 100% capacity; the figures can be read in terms of sales or costs.

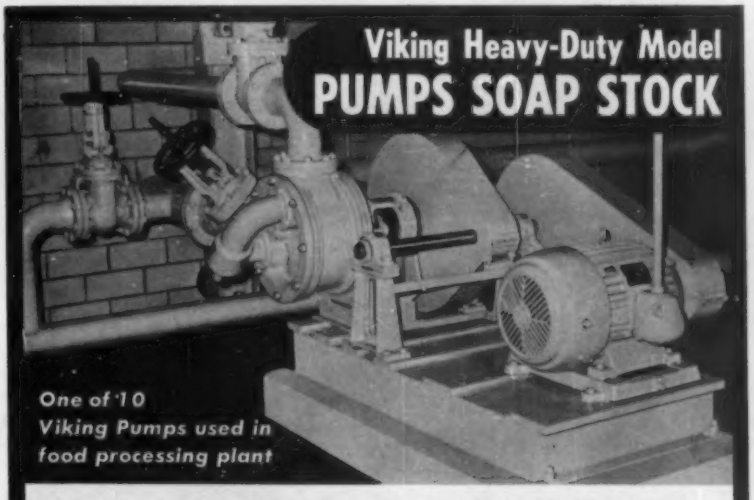
The sales line is a simple diagonal drawn from bottom left to upper right; this gives a rough sales volume for each operating rate. At the current operating rate, note the sales line intersects at the $10-million level.

Fixed costs ($2.5-million), since they do not vary with volume, become a straight horizontal line.

To plot the total cost line, mark the level ($9-million) at the current operating rate. Next, note that the total cost line begins at the terminal of the fixed cost line: Draw the diagonal from this point through the mark at the current operating rate. (In practice, more than one set of figures is usually used; then the total cost line is drawn as the straight line of best visual fit.)

Variable costs are not plotted directly. They can be found at any

continued on p 44



Anderson, Clayton & Co. Foods Division, processes Mrs. Tucker's vegetable oil products in its Texas plant. Soap stock is a by-product. As the material has a viscosity of 128,000 SSU, an "M" size heavy-duty, steel fitted Viking Pump is required to move the thick, viscous stock to storage tanks, tank cars and trucks. Plant management states they are well pleased with this pump and the nine other Viking pump units they use in various stages of processing vegetable oils.

Viking Pumps are famous for pumping thick liquids and semi-solids in the food processing, chemical processing and petroleum industries. If you have a thick liquid to pump, Viking will be glad to draw on its wealth of experience to help you solve it. For information, write for Catalogs Section C and Section M.

VIKING PUMP COMPANY

Cedar Falls, Iowa, U.S.A. In Canada, It's "ROTO-KING" Pumps
World Wide Sales and Service.

COPIES LETTERS . . . letter perfect . . . in just 4 seconds!

COPIES LEGAL DOCUMENTS with court-accepted accuracy!

COPIES INVOICES . . . quickly . . . without chemicals or fumes!

COPIES NEWSCLIPS, publicity . . . copies are clean and dry!

COPIES ENGINEERING DRAWINGS with smear-proof exactness!

COPIES TAX REPORTS . . . needs no special operator training!

COPIES RECORDS . . . electrically . . . no need to proofread!

COPIES PENCIL DRAWINGS sharply, clearly, dry and clean!

Thermo-Fax
COPYING PRODUCTS

"THERMO-FAX" AND "SECRETARY" ARE REGISTERED TRADEMARKS OF 3M CO., U.S.A.

See how you can save with "Thermo-Fax"®

The THERMO-FAX "Secretary" is the world's only all-electric dry copying machine. In only 4 seconds, it makes a perfect copy of practically anything written, printed, drawn, or typed . . . does it electrically without chemicals, fumes, or special masters. Every copy you make is ready to use instantly . . . no drying time needed. THERMO-FAX copies can't smudge or run; and for one or a dozen, you have the same low cost per copy. All this versatility in a machine that is compact, handsomely styled, completely portable—an attractive addition to any office!

3M COMPANY

WHERE RESEARCH IS THE KEY TO TOMORROW

For information about 3M products write: 3M Company, International Division, St. Paul 6, Minnesota, U.S.A.

鉱山 . . . minas . . . misimeng . . . mines

Wherever mines are worked, regardless of language spoken, you are certain to hear the words: "Gardner-Denver." The men who mine, the maintenance crews, the engineers and executives have come to respect this world-famous name and the reliable service for which it stands. Just as Gardner-Denver drills have spearheaded mining progress for over a century, so have other Gardner-Denver products earned prominence in oil field, construction and manufacturing development.

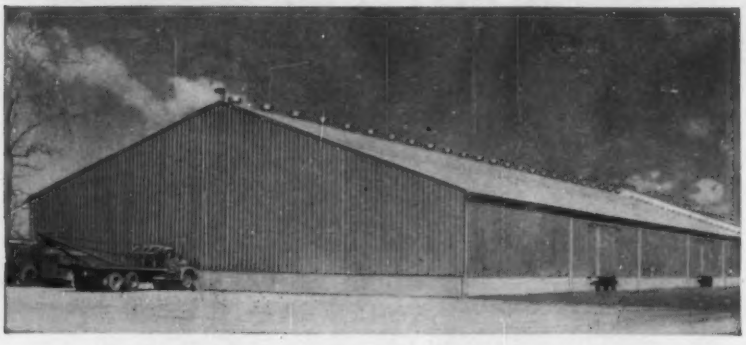
Now, from a fast-expanding international network of plants, Gardner-Denver products and local service are readily available.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver International Division • Quincy, Illinois, U.S.A.

Butler Buildings



Your best building buy

The theatre and the warehouse above are good examples of how standardized Butler steel building components can be utilized to provide a wide variety of buildings quickly and economically.

Whether you want simple, functional lines or a more distinctive architectural treatment, you'll get more for your money using the Butler Building System.

A Butler is the lowest-cost quality building you can buy. Features such as fast erection, easy expansion, effective lighting, weather-tightness, fire safety, and post-free interiors are inherent in Butler buildings and at a low cost, considering the quality of construction. They are designed to withstand wind loads of hurricane force.

Butler grain storage buildings are designed to withstand enormous bulk grain pressures. Tightly constructed, they keep grain clean, dry, bright. And, the total cost often is as little as one-third the cost per bushel of vertical structures.

BUTLER MANUFACTURING COMPANY

International Sales Subsidiaries:

Butler International Company • Butler Pan-America Company
7518 East 13th Street, Kansas City 26, Mo., U.S.A.
Cable Address: BUMANCO

BUTLER

BUILDINGS • OIL EQUIPMENT • GRAIN STORAGE FACILITIES

operating rate by subtracting fixed cost from total cost.

The break-even point is where the diagonal lines cross. It can be read as 50% of capacity, or as slightly over $7-million in sales.

For quick calculations, there is a short-cut method. With the round sales figure of $10-million, it is easy to see that 65% ($6.5-million) of the sales dollar goes for variable expenses. This leaves 35% to cover fixed costs and net profit. Since there is no profit at the break-even point, the fixed cost figure ($2.5-million) must be 35% of break-even sales. By a proportion sum, the break-even point works out to $7.14-million in sales.

• **Many Uses**—A few companies have built intricate control systems around break-even charts, and they swear by their usefulness. They use the charts to judge the performance of managers, and as a guide to budgeting and keeping costs in line. Perhaps their greatest use is in tracing the "path of profit" at various sales levels.

More frequently, however, break-even charts are calculated when there is a special need—when management is worried about profit margins, or the effect of price changes, added plant capacity, higher wages, fringe benefits, etc.

Also, with information taken from financial reports, break-even charts can be used to compare the performance of competitors, or as a check on important suppliers prior to price negotitions.

• **Fine Points**—The break-even concept has enough uses, in fact, to fill a 285-page book, *Profit Management and Control* (McGraw-Hill, 1955), by Fred V. Gardner, a U. S. management consultant.

Gardner warns that variable costs do not vary automatically. Many are partially fixed, he says, because management lacks the skill to make them go down, chooses not to, or is not allowed to vary costs that should be variable.

Gardner also suggests that "standby costs"—defined as the cost of staying in business—is more descriptive than "fixed costs." Many costs, he says, depend on a time element that is not "fixed" (a battery, for instance). In calculating break-even points, Gardner urges management to think in terms of "jagged segments of time." ●

How Clupak Builds a Licensing Family

Its formula: a "hot" product, non-exclusive licenses, competitive pressures.

WHEN CLUPAK, INC., New York, offered to license its patent for making a special "extensible" kraft paper—used in multiwall bags for cement, fertilizer, etc.—there was a compelling reason why several U. S. papermakers hastened into negotiations: One manufacturer was already in commercial production, and the product seemed "hot."

"This created competitive pressure," explains Dudley B. Smith, Clupak's director of licensing. Still, it took some tough negotiating to work out a satisfactory agreement. According to Smith, the prospective licensees "examined and re-examined each word in a long draft."

Smith recalls that after four months they "at last found terms that were profitable to both Clupak and the licensees." The date was November, 1958.

• **Reasons Why** — Two months ago, the first Clupak paper made outside the U.S.A., by Sweden's Dynas, AB. entered European markets. Competitive pressures, Smith notes, seem equally potent in Europe: "We have already received 'feelers' from kraft makers."

Not unnaturally, Smith rates competition the Number 1 reason why companies agree to pay license royalties. Reason Number 2 is a need to develop new markets. A prospective European licensee, in fact, is a French company that has on order a new high-capacity papermaking machine it hopes to keep busy with a new product.

There can be other factors, of course. The Clupak process offers a possible saving in raw materials. This argument was persuasive to three Japanese licensees, who are now awaiting government approval to pay royalties in dollars.

• **Not Typical**—Out of its first negotiations, Clupak developed a standard licensing contract. Unlike most license agreements—involving complete products, and matters such as participation in ownership—Clupak's contract has no sticky side issues; the licenses are non-exclusive, and Clupak's contract was negotiated between strong parties.

Still, Clupak's program reflects a philosophy of international licensing: Use royalties from current patents and products to pay for research aimed at producing new patents and products—thus perpetuating a position of leadership.

• **Joint Venture**—Clupak, Inc., is a joint venture, organized to serve the best interests of two parents. The basic patents were owned by Cluett, Peabody & Co., Inc. As a textile concern, with no experience in paper technology, Cluett, Peabody called in West Virginia Pulp & Paper Co. (Westvaco). Agreeing on a 50-50 split of future benefits, Westvaco spent $2.5-million to perfect the process. (Westvaco was naturally first on the market.)

Cluett, Peabody also controls the Sanforized trademark for preshrunk cotton fabrics; and it has 30 years' experience administering a non-exclusive licensing program. This was perhaps the decisive factor in favor of Clupak, Inc.

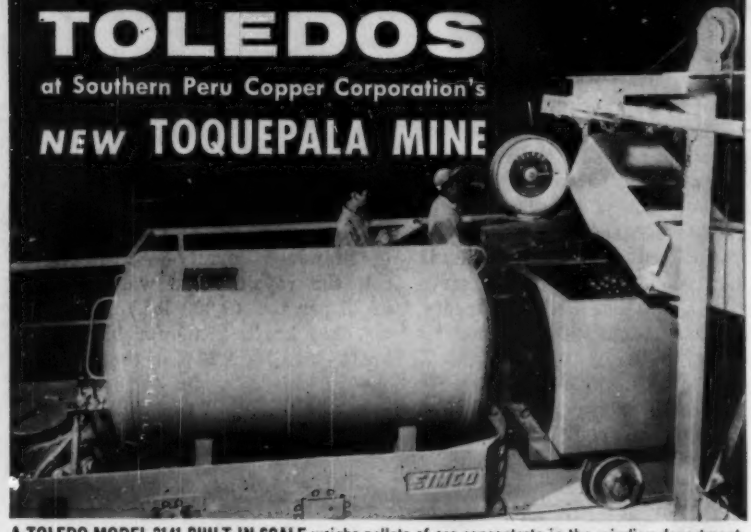
Cluett, Peabody contributed Clupak's president, Gerald E. Amerman, and Smith. The technical director, Vice President Hewitt S. Welsh, came from Westvaco. President Amerman reports to a six-man Board of Directors, three appointed by each parent.

• **Standard Royalty**—At the outset, the royalty rate was set at $2.25 per ton (2,000 lbs.) for unbleached kraft, $3.00 for bleached kraft—roughly 1.25% of the wholesale selling price. On April 1 each year, the rate is adjusted to changes of plus or minus 1% or more in the U.S. index of wholesale prices (minus farm and food products). The first adjustment, effective April 1 this year, raised the rate 2%, to $2.30 and $3.06.

There is a minimum royalty payment, holding for three years. Smith says this was one of the toughest points to negotiate. But as it has turned out, the controversy was needless. So far, all licensees are devoting more than

75
YEARS
IN ORBIT
AROUND THE WORLD!
HIGHEST
QUALITY!
STAR HACK SAW BLADES
No better hack saw blades made (no second best in this line). Fine alloy steel plus expert design and uniform, precision fabrication by experienced craftsmen. STAR HACK SAW BLADES are fully checked and tested step by step for consistent quality. Result—correct hardness, fast, easy cutting and long blade life. Line is complete in every type, tooth set and size.
Inquiries invited from established agents in certain areas.
CLEMSON BROS., Inc.
Middletown, N.Y., U.S.A.
MAKERS OF HAND AND POWER HACK SAW BLADES, FRAMES, STANDARD AND HIGH SPEED STEEL METAL CUTTING BAND SAW BLADES, HIGH SPEED HOLE SAWS, FILES, AND CLEMSON HAND LAWN MOWERS.

copper weighs-in on
TOLEDOS
at Southern Peru Copper Corporation's
NEW TOQUEPALA MINE



A TOLEDO MODEL 2141 BUILT-IN SCALE weighs pellets of ore concentrate in the grinding department.

SMELTER OPERATIONS, Toquepala Mine in Peru

TOLEDO AUTOMATIC LABORATORY SCALES assay ore samples at the smelter.

Jobs like heavy-duty weighing of ore concentrates and assaying ore samples demand high precision and dependability, at the new Toquepala Mine high in the Peruvian Andes. That's why Southern Peru Copper Corporation put Toledos on the job at Toquepala—one of the largest mining projects of the decade.

In Toquepala's operations, as in modern mining, manufacturing and other business operations world-wide, Toledos guard against losses, protect profits, preserve good-will with dependable weighing performance. In Toledo's complete line, you'll find the right answer to your weighing problems—including Toledos that *print* complete weight records automatically. Write today for new Condensed Catalog 2001. TOLEDO SCALE, Division of Toledo Scale Corporation, Toledo 12, Ohio.

SERVICE Factory-Trained 340 Cities

TOLEDO®
GREATEST NAME IN WEIGHING

minimum production (one quarter of capacity) to Clupak kraft.

• **Other Provisions**—On the advice of antitrust lawyers, Clupak's contract does not carry a full "grant-back" clause. That is, a licensee is free to apply for related patents on his own. But if the patent cannot be used without infringing Clupak's patents, the owner agrees to license other Clupak licensees royalty free.

Since a trademark is involved, Clupak specifies quality standards, backed by sample testing and inspection rights. To guard against trademark infringements by nonlicensees, Clupak subscribes to the "watching service" of a London company, and maintains a network of attorneys in 97 countries.

There are no fees for technical service, but overseas licensees pay expenses for visiting experts. Clupak also counsels on marketing.

Surprisingly, the contract does not have an arbitration clause. In view of Cluett, Peabody's experience, Clupak decided against it.

• **Research Program** — Clupak leases laboratory space from Westvaco; and research personnel are supplied to Clupak on a "per diem" basis. Research costs are running about $300,000 a year.

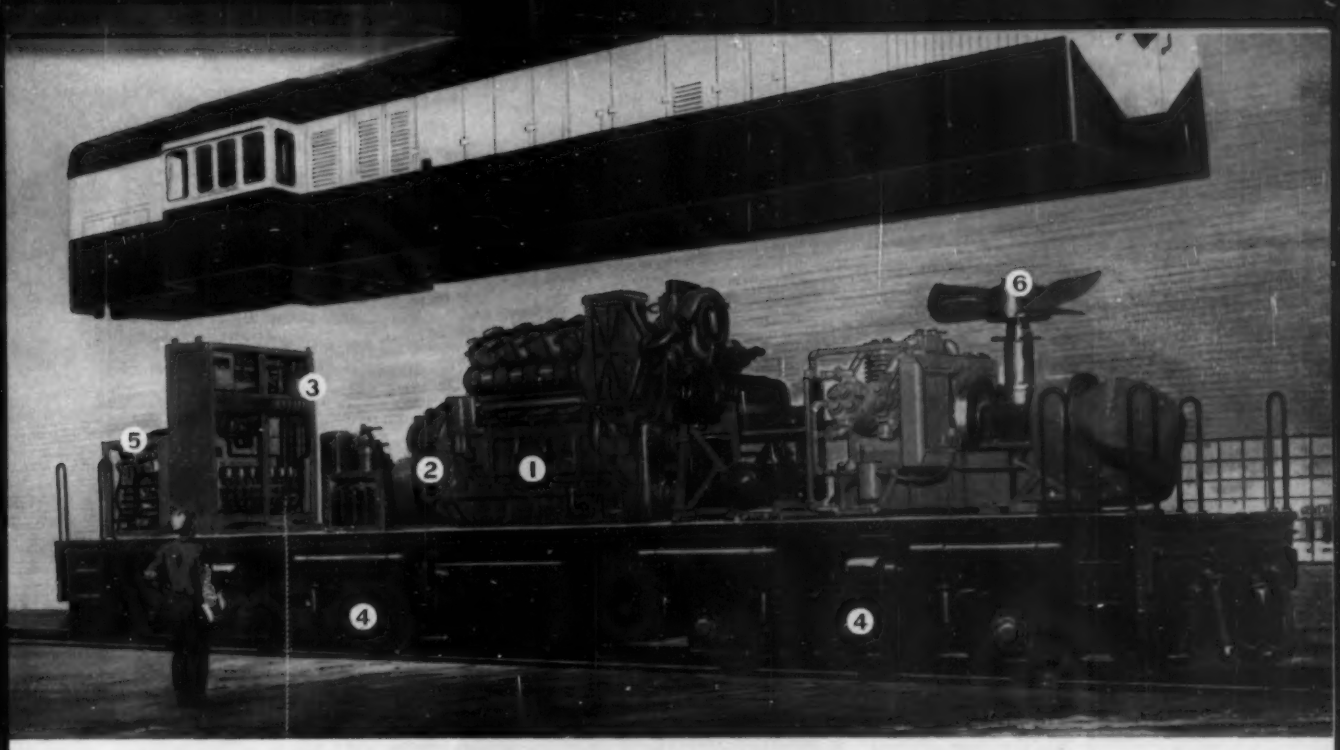
Research is also carried out by licensees and potential licensees, in an effort to adapt the Clupak process to other paper products. (One promising area: nonwoven fabrics.)

• **Equipment Needed** — Clupak does not make the equipment used in the process. Any paper-machine builder can make the "extensible units" under Clupak license.

A unit costs anywhere from $75,000 to $500,000, depending on the paper-making machine (which costs up to $25-million).

• **The Product**—Because Clupak kraft paper extends under stress, it has a "toughness" quality lacking in standard kraft. This means that bags can have lighter walls.

Westvaco, for example, makes cement bags with three Clupak walls, with a total "basis weight"—the industry measure of paper content—of 140. This bag competes with standard kraft bags made with four walls, having a total basis weight of 170. Westvaco claims that its customers are saving $2.75 per thousand bags, with less breakage in shipments. ●



Compare the difference...

G-E universal locomotives are the result of skilled manufacturing and superior product design

❶ **DIESEL ENGINE** of modern 4-stroke turbosupercharged design is built for long life and fuel economy. Exclusive cylinder design provides better cooling, longer engine life, and easier "upper end" maintenance with maximum interchangeability. Articulated connecting rod doubles effective rod bearing area.

❷ **GENERATOR** is mounted directly on the engine. This permits single-bearing construction which eliminates mis-alignment. Flashover tendency is designed out. Simple flexible electric cables are the only transmission connection to the trucks. Ample capacity is available for steep grades, heavy trains and high speeds.

❸ **CONTROLS** are the essence of simplicity. Responsiveness and reliability have been assured by keeping the number of moving parts to a minimum and by using factory-set adjustments.

❹ **HIGH-SPEED TRUCKS** complete with powerful traction motors mounted on each axle have a worldwide reputation for reliability, long life, and high efficiency. Single spur gear of motors drives each axle directly.

MECHANICAL DESIGN is simple, rugged, efficient. Dynamic braking ❺ can be easily added to facilitate train handling, reduce brake shoe wear. A single, direct-driven variable speed fan ❻ gives increased air cooling efficiency. Interchangeability and standardization throughout the universal line reduce parts inventory.

IN ADDITION to these product features, the engineering skill of General Electric is utilized for motive power recommendations based on surveys by experienced technicians; research and development to constantly improve components and concepts, testing complete locomotives on a private multi-gage test track.

Throughout the world General Electric locomotives have established enviable records of performance by producing high gross ton mileages at low cost. To learn how these universal diesel-electric locomotives can benefit your railway, contact your International General Electric representative. 135-E33

Progress Is Our Most Important Product

GENERAL ELECTRIC

LOCOMOTIVE AND CAR EQUIPMENT DEPARTMENT • ERIE, PENNSYLVANIA, U.S.A.
Represented throughout the world by the International General Electric Company
Main Office: 150 East 42nd Street, New York 17, New York, U.S.A.

Rare Metals

NEW TECHNIQUES demand new materials. Behind the rapid advances in today's fastest-growing fields—electronics, nucleonics, aviation and space technology, thermoelectricity—have been equally impressive advances in metal science. A dozen or more exotic metals are playing a key role, and are extending the horizon of all these and many other industries.

Take what is happening in one of the newest and most promising of these fields—thermoelectric devices, which can directly convert heat into electricity and electricity into heat (or cold) without moving parts. They promise cheap portable power plants, compact refrigerators, novel heating and cooling systems.

The principles underlying thermoelectric devices, utilized in the common thermocouple, have been known for more than a century. But proper metals were not available to further the science. They are coming now—ultra-pure compounds of bismuth, lead, selenium and tellurium.

• **Improved Semiconductors**—Electronics offers an even more dramatic example. Here is an industry that has been doubling in size every year for the past ten. Electronics depends on semiconductors, and semiconductors depend largely on two metals—silicon and germanium. And now improved electronic devices are on their way, through the development of high-purity arsenic, indium, gallium, and other metals.

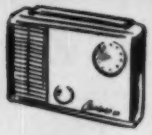
Rare metals also are being tested for structural uses, as alloys and coatings for jet planes, missiles, rocket nozzles, and atomic reactors. Beryllium is already in use in these applications. It soon may be joined by columbium (known as niobium in Europe) molybdenum, tantalum, tungsten titanium, zirconium, and several more.

I. Perfecting the Art

All of these metals have been known for many years, and several have seen limited use in commerce. Two things have happened to put

Some Rare Metals—and Their New Jobs

As ARSENIC



Compounds using 99.999% pure arsenic will mean better radios, computers. Tiny amounts now go into semiconductors; new devices will use much more.

Be BERYLLIUM

A bright future in atomic plants, high-temperature structural parts. Beryllium slows down the absorption of neutrons, offers good thermal protection.

Bi BISMUTH

Bismuth compounds form the heart of thermoelectric devices that turn electricity into intense heat and cold — for no-moving-parts heaters and refrigerators.

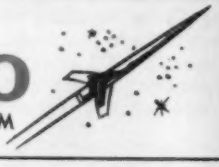
Cb COLUMBIUM

Melting at 2415 C, columbium promises diverse uses — parts for missiles, alloying for jet-engine blading, cladding in high-temperature nuclear reactors.

In INDIUM

Used in the past as a carrier in germanium semiconductors, indium now is being combined with arsenic, phosphorus, antimony, in improved electronic devices.

Mo MOLYBDENUM



Planned for missiles, rockets. Molybdenum melts at 2662 C, remains strong at high temperatures. But it must be coated to prevent oxidation.

Se SELENIUM

Past uses have been in rectifiers, xerographic printing, rubber vulcanizing. Now it shows promise in thermoelectricity, with bismuth, or both bismuth and tellurium.

Ta TANTALUM

With a top melting temperature — 2996 C — this metal has a big future in missiles. Extremely resistant to acids, it is now used in electrolytic capacitors.

Te TELLURIUM

With bismuth, one of the most promising candidates in thermoelectric equipment. In the past, the metal has been used largely as a research tool.

Keep New Technologies Growing

the rare metals in the center of the industrial stage.

1. **New material requirements.** The new technologies had to have materials that could withstand ultra-high temperatures, unusual conditions of stress and corrosion. They also needed metals with special chemical, electrical, and magnetic properties.

2. **Advances in metallurgical research.** Metallurgy has become closely allied with chemistry. Scientists have found new ways to isolate and extract the rare metals, and new techniques are making these metals more economical to refine, purify, and mold into usable form.

• **Not So Rare**—Many of these so-called "rare metals" are neither rare nor scarce. Silicon is second only to oxygen as the most plentiful element in the earth's crust. And mineralogists now believe that the earth contains more columbium than either cobalt or lead.

But it is a long way from the silicon found in sandstone and rocks to the high-purity product required for transistors. The distance can roughly be measured in price. Ferrosilicon, containing 50% silicon and 50% iron, costs only about one penny a kilogram. But semiconductor-grade silicon sells for over $900 a kilogram.

A similar contrast could be shown for other rare metals. It reflects the intricate and costly task of processing and refining these metals. Many of them are found widely distributed throughout the world, but only as minute quantities in other ores. Bismuth and antimony, for example, appear in lead; arsenic, selenium and tellurium in copper deposits.

Only during the last two decades have scientists found economic means of extracting some of these metals from their ores. And only within the last two or three years have techniques been developed for refining them to the purity required by industry, and for learning how to mold and work them.

• **99.999% Pure**—Laboratories in the U. S. and Europe have been making sensational strides in bringing metals to their highest purity. One large U. S. company, American Smelting & Refining Co., today supplies industry with metals that are over 99.999% pure—with only 10 parts of impurities in a million parts of metal. Other companies can do the same, and all are aiming for metals that will have only one part per million of impurities. Not only are the rare metals being refined in this fashion, but so are copper, silver, lead, and zinc.

The most advanced chemical and electrochemical techniques are being used for these purposes. Included are improved vacuum processes, reactions at extreme pressures and temperatures, zone melting processes, high energy forming, electron beam melting.

Stauffer-Temescal Co., U.S.A., has developed an electron beam furnace that purifies such high-temperature metals as columbium, molybdenum, and tantalum. The commercial-grade metal (99.75% pure) forms an anode that is bombarded by electrons in a tank reduced to one-millionth of an atmosphere of pressure. The high-purity metal drips from the feedstock into a cylindrical chrome-lined copper ingot mold cooled by swiftly moving water.

II. Electronic, Thermoelectric

High purity becomes absolutely critical in the latest electronic and thermoelectric devices. In both fields, success depends on the controlled behavior of electrons. Materials must not only be pure. The exact nature of their impurities—in parts per million—must be calculated and controlled.

Minute quantities of arsenic, for example, today are used in "doping" silicon crystals. It is the arsenic impurity that in essence changes the base metal from a conductor to a semiconductor. Indium serves a similar purpose in germanium semiconductors.

Electronics engineers soon hope to use far larger quantities of both of these metals in new applications. Arsenic production, one expert predicts, will jump from kilograms per month to hundreds of tons per year. The metals will be used in the form of inter-metallic compounds—indium arsenide, gallium arsenide, indium phosphide, among others—that will give new efficiency and versatility to specialized electronic equipment.

• **Bismuth Compounds** — Renewed interest in thermoelectricity has come from the development of other inter-metallic compounds, using ultra-pure grades of bismuth, lead, selenium, and tellurium. Bismuth telluride looks the most promising, but lead telluride and triple compounds of bismuth, selenium, and tellurium also are being tested in laboratories.

Pass electricity through most metals, and you get diffused heat. But pass a current through a junction of bismuth telluride and a dissimilar metal and you get an entirely different phenomenon. Heat concentrates at one surface, extreme cold at the other.

Advanced metallurgy now promises to use this principle (the Peltier effect) for refrigerators with no moving parts, and other special heating-cooling devices. Development is going ahead at a fast pace, and initial units may soon be tested in submarines and space vehicles. Pilot units using the reverse procedure—conversion of heat into electricity—have been built and are being tested.

III. Atoms and Space

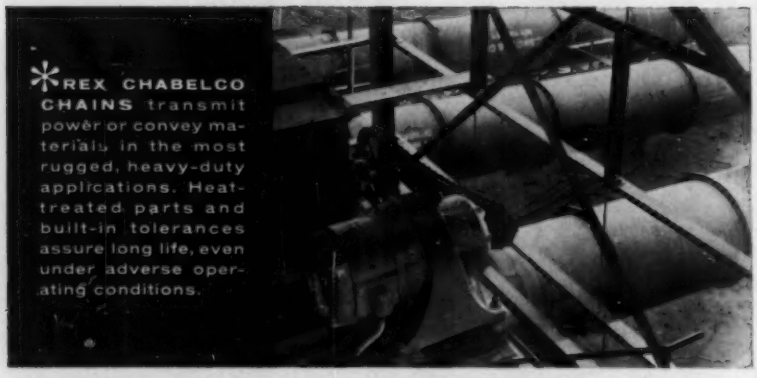
Bismuth is one of the most versatile of rare metals. For years it has been used as a pharmaceutical (indigestion remedies) and as an element in fusible alloys, employed in everything from safety fuses to aircraft and textile dies. Now it shows promise in both thermoelectricity and atomic applications.

Bismuth has an usually low melting point (271 C) and a high boiling point (1560 C). These two properties make it valuable as a coolant in atomic reactors.

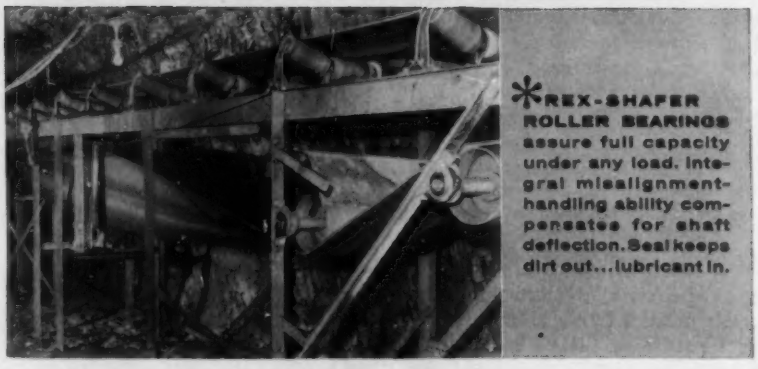
Ultra-pure bismuth also serves as an excellent atomic-ray filter. When used on the lens of an accelerator, the metal filters out

Efficient answers * for production problems

*REX BUCKET ELEVATORS step up production through efficient, dependable operation. Their long-life, low-cost operation keeps production moving... profitably.



*REX CHABELCO CHAINS transmit power or convey materials in the most rugged, heavy-duty applications. Heat-treated parts and built-in tolerances assure long life, even under adverse operating conditions.



*REX-SHAFER ROLLER BEARINGS assure full capacity under any load. Integral misalignment-handling ability compensates for shaft deflection. Seal keeps dirt out... lubricant in.

If your production problems involve the efficient transmission of power, conveying and elevating of bulk materials, your best solution is Rex Power Drive and Conveyor Chains, Belt Conveyors, Bucket Elevators and Roller Bearings. These dependable components are known the world over for their ability to deliver plus-value performance under the most difficult operating conditions.

Your local CHAIN Belt Distributor will be happy to give you the complete story on these production-building products as well as the Rex Line of Water and Waste Treatment Equipment.

CHAIN Belt also makes Rex Concrete Construction and Concrete Road-Building Equipment. CHAIN Belt Company, 4654 W. Greenfield Ave., Milwaukee 1, Wis., U.S.A.

REX®

CHAIN BELT COMPANY

EXPORT OFFICES: Milwaukee 1, Wis., and 19 Rector St., New York 6, N.Y., U.S.A. Distributors in all principal cities of the world. Cable Address: "BELTCHAIN."

gamma rays, alpha and beta particles, but allows a large proportion of neutrons to pass.

• **Demand for Beryllium**—The rare metal beryllium was almost unknown to industry two years ago. Now it is making rapid strides in atomic work, and showing good potential in aircraft and missile applications. U.S. production has jumped from about 45,000 kilograms in 1958 to 140,000 this year.

Like bismuth, beryllium has low neutron absorption. It is used as a filter in X-ray machines and as a moderator and reflector in atomic reactors. Several European atomic plants use nuclear fuel elements clad with beryllium.

Beryllium also is receiving serious consideration as a structural material in jet aircraft, missiles, and space vehicles. The metal is light, stiff, and offers good thermal protection. Though brittle at normal purity, it can be made malleable by high-purity techniques. Experts say that the first man-carrying space vehicle will use a substantial amount of beryllium.

• **Ultra-High Temperatures** — Other metals being groomed for the jet and space age include columbium, molybdenum, and tantalum. These are refractory metals, with boiling temperatures of from 2440 C to 3000 C. Their greatest promise therefore is in equipment such as reactors and missiles where materials must withstand extreme heat, pressure, and corrosion.

Columbium and tantalum often are linked together. They coexist in nature, they have many of the same chemical traits, and they go into many of the same alloys.

Until five or six years ago, columbium was in short supply. The discovery of large deposits in South America now has improved its prospects for development. New techniques also have been made available for alloying the metal, and much work now is being done to improve methods for rolling and forming it.

This portends a bright future for columbium, often in combination with tantalum or tungsten. A new U.S. rocket plane uses 1% columbium on its outer surface. Columbium alloys also are being extensively tested for jet engine blading, where they may replace alloys of nickel and cobalt. ●

MOTOROLA world's largest producer of 2-WAY RADIO

More modern businesses and public services keep in constant personal voice contact with their vehicles via Motorola radio than any other radio in the world. The reason: Motorola's 3 decades of pioneering research and engineering experience has obtained the highest operating reliability and long-term economy. And, you are assured of continuous unmatched performance by an expert, dependable maintenance and parts service organization.

Write, wire or telephone for information about Motorola's complete communications service: specialized systems planning and product engineering; installation; parts and maintenance.

"Handie-Talkie" is a trademark of Motorola Inc.

FREE—send for 16 page product catalog No. 13

SOLD AND SERVICED IN 60 MAJOR COUNTRIES THROUGHOUT THE WORLD

MOTOROLA
2-WAY RADIO

Contact Motorola Overseas Corporation, 4545 Augusta Blvd., Chicago 51, Illinois, U.S.A. Cable: Motol for your complete communications needs: Microwave, Data Transmission, Industrial Television, Semi-Conductor Devices, Television, Home and Auto Radio.

RIDES OFF 40 TONS

WITHOUT HANGUP!

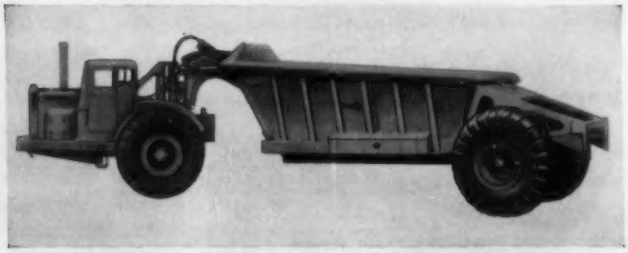
Say goodbye to hung up units, slowed down cycles, costly operation. The Athey PW20 hauls 40 tons fast and dumps it exactly where you want it—*instantly!*

The PW20—built entirely of super-strong T-1* Steel—has a unique rear door plus big wide bottom doors and a high five foot rear clearance. *All* the load spills out in one neat pile ready for 'dozing. No hanging up on its own load, no carrying back part of the load to the shovel, no stopping to push the rig free. One yank of the dump lever and every bit of that 40 tons is gone—*right away!*

With the Caterpillar DW20 Tractor up front, this rig gives you the features you need to cut cycle time: Tough T-1 Steel trailer construction, 35.8 mph speeds, instant dumping *every time*, Caterpillar SynchroTouch Transmission control, sensible cable-hydraulic door mechanism, and the tops in vehicle weight-to-payload ratio.

Get the PW20 facts and figures from your Athey-Caterpillar Dealer. He can show you how the PW20-DW20 team paid off for others.

*Registered trademark, United States Steel Corporation



SOMETHING NEW! It's the 35 ton twin brother of the PW20—the PW21 teamed with the Caterpillar DW21 Tractor. All the features of the PW20 plus extreme maneuverability.

WRITE NOW for your copy of the "PW20 Job Report"—the on-the-job story of the PW20-DW20 team in action.

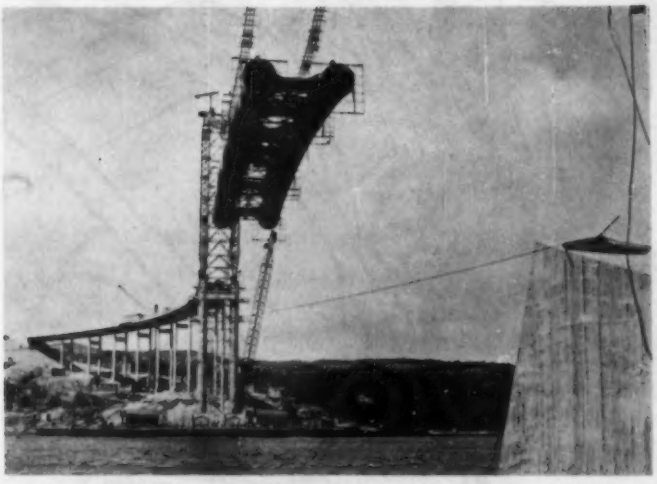
Athey

PW20 BOTTOM DUMP TRAILER

Athey PRODUCTS CORPORATION, 5631 WEST 65TH STREET, CHICAGO 38, ILLINOIS

Designers chose this bridge for . . .

Crossing a Busy Fjord With an Arch of Steel



Tube assembly began at the center of the arch, went both ways . . . and then was lowered to abutments.

SWEDISH AND GERMAN engineering talents have combined to build one of the world's unique bridges, spanning the busy shipping lanes in Askero Fjord Sweden.

The problem: the cheapest way to cross a 274-meter-wide channel without piers and yet have a structure that would withstand winds as high as 145 kph.

The answer: an arch bridge made of thin-walled steel tubes about .9 meters in diameter.

The tube-arch structure, now nearing completion, is part of a three-bridge system connecting the islands of Tjorn and Ohrust with the mainland. Prime contractor on the project was AB Stanska Cementgjuteriet of Stockholm. West Germany's M.A.N. designed the bridge; then combined with DEMAG, also of Germany, in fabrication and erection.

• **Wind Tests**—Before construction, engineers carried out wind-tunnel tests to determine the strength and aerodynamic characteristics of the design. Designers found that they could lower wind resistance by using circular columns to support the bridge deck on the arch.

Erection of the arch had to be done with as little interference to shipping as possible. This consideration, and the lack of any flat area near the bridge approaches, dictated prefabrication of tube sections in Germany. The sections were shipped by barge to the job site in eight- or nine-meter lengths.

Tube lengths were then transferred from the barges onto a floating platform. They were riveted and bolted into sections 23 to 38 meters long.

• **Temporary Towers**—To erect the tube arch, engineers built temporary towers on either end of the structures. The towers supported two suspension cables and a series of lifting cables.

Workmen first lifted a short center section of the arch into place. This was followed by successively longer sections on either side of the center. (The entire arch consisted of eleven sections.)

During erection, engineers maintained a careful check of the shape of the arch. Erection was done only in moderate winds and when shipping traffic was light.

When the arch was completely assembled, workmen lowered it onto the abutments. The arch was bolted to the abutment at each end with a prestress of about 5,000 tons. Columns for the bridge deck were then put in place. (*Engineering News-Record, May* 5, *p* 34)

Basis for beauty

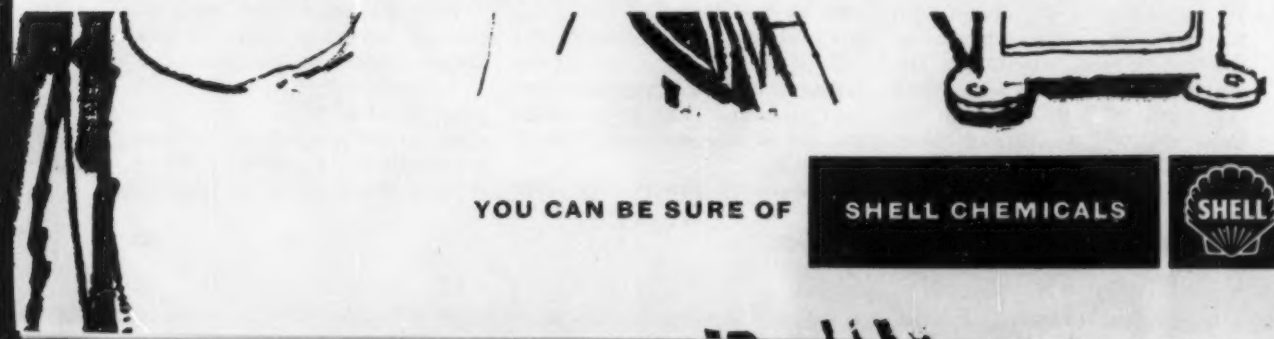
Beauty begins in a factory . . . with exotically-named mixtures poured into lipstick moulds. Whether it's Tomato Red, Paris Pink or Orange Peach, the mixture probably contains glycerine . . . a colourless liquid that will give the lipstick its fresh moistness and soft, smooth 'feel'. In lotions, creams, conditioners, in many cosmetics, you will find glycerine . . . the foundation of loveliness.

Glycerine has hundreds of uses. It puts the pliability into transparent paper. It is used by tobacco and paint manufacturers. This harmless product is even a raw material for the synthesis of propellants and industrial explosives. It is very often found in foods and pharmaceuticals, in toothpastes and candy bars. For all these uses, glycerine of high purity is needed.

Shell glycerine meets the most stringent quality requirements—with purity of over 99.5%. This high standard never varies. Buyers know that this consistency of Shell glycerine means savings in time and money. In this and other ways. Shell chemicals are filling an important role in industry throughout the world. Detergents, plastics. synthetic rubbers, solvents, additives . . . perhaps, in the Shell range, there is a chemical that would do a better job for you?

Shell Glycerine *(Not available in the U.K.)*

Issued by Shell International Chemical Company Limited.
For further information apply to your Shell Company.



YOU CAN BE SURE OF SHELL CHEMICALS

SHELL

INTERNATIONAL
MANAGEMENT'S

Technology in Brief

Electronic Eye Guides Welding Unit

A technique now being used by A. O. Smith Corp., U.S.A., guides an automatic welding head down the center of a joint even when edges of the parts are irregular. An electronic sensing device adjusts the location of the arc and keeps it constantly centered in the weld groove. The technique is able to put weld metal in the right place at speeds of up to 500 cpm, compared to manual welding's maximum of 100 cpm for the same job. (American Machinist/Metalworking Manufacturing, May 2, p. 103)

Contest Searches for Technical Answers

Czechoslovakia is attempting to stimulate technical innovation in the construction field by a country-wide contest among inventors and workmen. The contest poses 15 technical problems, and offers prizes ranging from 2,000 to 6,000 crown ($277.78 to $833.34) for the best answers. Top prizes are offered for—1) equipment for the speedy unloading of sand, gravel, and similar material; 2) improved machinery for producing lightweight concrete blocks and panels.

Europe Looks to Integrated Air Control

Four technical committees now are hard at work evaluating equipment and estimating costs for an integrated air-traffic control system for Europe. Legal aspects of the system have been settled, but committees still have to decide on the number and location of centers. Presently, air traffic is controlled from 14 centers: three in Britain, France, Sweden, and West Germany; one in Holland and Denmark. The proposed system will operate on an area, rather than a national, basis. (Electronics, April 22, p 40)

Polypropylene for Food Packaging

Polypropylene film developed by Hercules Powder Co. now has been approved by U. S. authorities for food packaging. The film is said to have the best virtues of cellophane and polyethylene, and to eliminate several of their drawbacks. It has the clarity of cellophane, and is not affected by temperature and humidity changes. It is said to be more trouble-free than polyethylene on packaging machines. (Food Engineering, May, p 95)

Water-Based Paint for Exterior Use

U. S. paintmakers are testing water-based linseed-oil exterior paints, developed by the U. S. Department of Agriculture. U.S.D.A. researchers combined linseed oil with all three types of emulsifiers: cationic, anionic, nonionic. Continuing research is aimed at finding a mildew inhibitor that can be added to the paint. (Chemical Week, May 14, p 100)

In One Sentence . . .

British researchers have found evidence that a diet of polyunsaturated fats (seed and corn oils) may be more effective in reducing the blood cholesterol level of heart patients than a simple low-fat diet. . . . A U. S. builder has been using a TV camera to supervise pouring concrete 30 meters below the surface of the Pacific Ocean. . . . And a Canadian contractor is sending concrete over soggy land by mono-rail.

Steel Process Speeds Output

A STEELMAKING PROCESS that is said to greatly increase the output of open-hearth furnaces has been developed by U.S.A.'s Ford Motor Co.

The process relies on two innovations: 1) it adds natural gas to the oxygen introduced through lances; 2) it substitutes burned lime for the limestone used in conventional operations.

These two changes result in faster chemical and thermal reactions during the initial scrap-melting stage of the open-hearth cycle. Molten iron can be added to the charge more rapidly without the danger of "freezing" in the furnace.

Ford officials believe that the new process will greatly enhance the competitive position of open-hearth furnaces. In experimental runs, the company has more than tripled the production rate of a 20-ton furnace —from its original 20-tons/hour to an average of 67.6 tons/hour.

Ford itself does not have the pig iron or rolling capacity to exploit the new process to full advantage. Full evaluation is expected to come from the steel industry proper.

Many steelmakers, however, question the feasibility of more than doubling open-hearth production with existing charging and steel-pouring equipment. They also are skeptical about the economics of substituting burned lime, costing about $20/ton, for limestone, which costs only $2.50-$3.00/ton. (*Chemical Week, May* 28, *p* 77)

Zinc Fuel Cells for Lift Trucks

THE FIRST COMMERCIAL USE of the fuel cell probably will be in industrial lift trucks. Allis Chalmers has a model under development (IMD, June, p33). And now 12 lift truck manufacturers have joined in a fuel-cell testing program with one of the U.S.A.'s largest battery makers, Exide Industrial Division of Electric Storage Battery Co.

The effort of these 13 U. S. companies will be aimed at testing Exide's recently developed fuel cell —using zinc and oxygen, rather than hydrogen and oxygen, as a fuel—in various in-plant trucks doing rugged lifting and hauling jobs.

• **Zinc Replaces Oxygen**—By using zinc instead of hydrogen (or a hydrocarbon), Exide officials say they have simplified the fuel cell and solved one of its most annoying problems. A hydrogen-oxygen cell generates water as a by-product, which can dilute the electrolyte used. The Exide cell ends up with a by-product of zinc oxide.

The new zinc-oxygen cell is basically an advanced type of storage battery. But it uses an outside fuel source and lasts much longer than a battery. After 18 to 24 hours of heavy use, the cell either can be recharged or have its zinc electrodes replaced. The cost of replacing the electrodes is largely offset by the value of the recoverable zinc oxide.

Exide officials say that the new zinc-oxygen cell has more power potential than other fuel cells now under consideration. It operates at nearly normal temperatures, yields no waste products that have to be removed, and it can be built in almost any size—to satisfy a wide range of power demands. Also, the unit lends itself to mass production methods.

The company hopes to have fuel-cell operated trucks in industrial plants within three years. After that, it plans to put these silent and efficient sources of power in cars and over-the-highway trucks. ●

ADVERTISERS

in this issue

OVERSEAS EDITION

ADDO, AB 10
Agency—AB Wallin-Reklam Aukt. Annonsbyra

ALCOA INT'L INC. ..... 4th Cover
Agency—Fuller & Smith & Ross, Inc.

ALLIS-CHALMERS INTERNATIONAL 32-33
Agency—Bert S. Gittins Adv., Inc.

ANDERSON CO., V. D. 57
Agency—Will, Inc.

ATHEY PRODUCTS CORP. 52
Agency—Waldie & Briggs, Inc.

BELLOWS-VALVAIR DIVISION OF IBEC... 5
Agency—Ralph Gross Adv., Inc.

BRITISH OVERSEAS AIRWAYS CORP. 12
Agency—Foote, Cone & Belding, Ltd.

BURROUGHS CORP. 13
Agency—J. Walter Thompson

BUTLER MFG. CO. 44
Agency—Aubrey, Finlay, Marley & Hodgson, Inc.

CHAIN BELT CO. 50
Agency—Buchen Co.

CIMEX—FRASER TUSON LTD. 27
Agency—City & General Adv. Ltd.

CLEMSON BROS., INC. 45
Agency—Tyson & Co., Inc., O. S.

COLUMBIAN STEEL TANK CO., INT'L.....21
Agency—Rogers & Smith Adv. Agents, Inc.

COMBUSTION ENGINEERING INC. 58
Agency—G. M. Basford Co.

DAIMLER-BENZ, A. G. ..... 2nd Cover
Agency—Huemann, Werbegesellschaft MBH

FORD MOTOR CO., LTD. 11
Agency—Rumble, Crother & Nicholas, Ltd.

GARDNER-DENVER CO. 43
Agency—Buchen Co.

GENERAL ELECTIC CO., IN'L. 47
Agency—Gotham-Vladimir Adv., Inc.

GENERAL MOTORS OVERSEAS OPERATIONS 31
Agency—Richard T. Brandt, Inc.

HENRY VALVE CO. 45
Agency—Hudson & Assoc., Inc., Raymond C.

HITACHI LTD. 28
Agency—Dentsu Adv. Ltd.

HYSTER COMPANY ..... 3rd Cover
Agency—Cole & Weber

MINNESOTA MINING & MFG. CO. 42
Agency—Batten, Barton, Durstine & Osborn, Inc.

MITSUI BUSSAN KAISHA, LTD. 36
Agency—Hakuhodo Advertising Agency Inc.

MITSUI SHIPBUILDING & ENGINEERING CO., LTD. 24
Agency—Hakahodo Adv. Agency

MOTOROLA OVERSEAS CORP. 51
Agency—Kolb & Abraham Adv.

MUELLER BRASS CO. 14
Agency—Price, Tanner & Willcox, Inc.

OHIO CRANKSHAFT CO. 7
Agency—Carr Liggett Adv., Inc.

OWATONNA TOOL CO. 40
Agency—E. T. Homeren, Inc.

PINTSCH BAMAG A. G. 9
Agency—Adverta

PYE TELECOMMUNICATIONS LTD. 37
Agency—Arks Publicity, Ltd.

SHELL INT'L CHEMICAL CO., LTD. 54
Agency—Auld & Tilbury, Ltd.

TOLEDO SCALE CO. 46
Agency—Beeson-Reichert, Inc.

TORONTO HARBOUR COMMISSIONERS. 27
Agency—Foster Adv. Ltd.

UNITED STATES STEEL EXPORT CO. 35
Agency—Batten, Barton, Durstine & Osborn, Inc.

VICTOR SAW WORKS, INC. 45
Agency—Tyson & Co., Inc., O. S.

VIKING PUMP CO. 41
Agency—Wesley Day & Co., Inc.

WALLACE & TIERNAN, INC. 30
Agency—Branstater Associates, Inc.

WESTINGHOUSE ELECTRIC INT'L CORP. ..22-23
Agency—Gotham-Vladimir Adv., Inc.

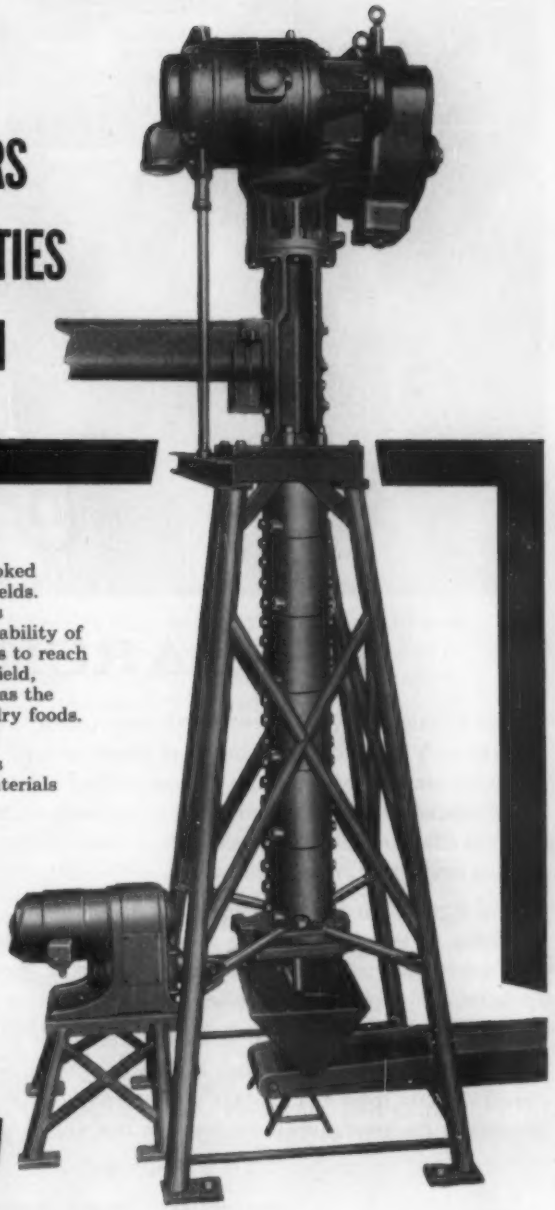
YALE & TOWNE MFG. CO. 34
Agency—Erwin Wasey, Ruthrauff & Ryan, Inc.

YODER COMPANY 39
Agency—G. M. Basford Co.

SALES REPRESENTATIVES

New York 36.....K. P. Bliss, D. L. Trimble, 500 5th Avenue
Boston 16.....D. M. Coddington, 350 Park Square Bldg.
Chicago 11.....J. P. MacLeod, A. Burgett, 520 N. Michigan Avenue
Cleveland 13...W. S. Bliss, 1164 Illuminating Building
Dallas 1.....G. Jones, 901 Vaughn Bldg.
Detroit 26.....Lee Cashin, 856 Penobscot Bldg.
Houston 25.....F. E. "Gene" Holland, W-724 Prudential Bldg.
Philadelphia 3..D. L. Trimble, 6 Penn Center Plaza
Pittsburgh 22.....W. S. Bliss, 919 Oliver Bldg.
St. Louis 8.....A. Burgett, 3615 Olive Street
Atlanta 3.....M. H. Miller, 1301 Rhodes-Haverty Bldg.
Los Angeles 17.....W. Gries, 1125 West 6th Street
San Francisco 4..J. J. Hernan, 68 Post Street
Denver 2.....J. W. Patten, 1700 Broadway
Germany..S. Kimes, McGraw-Hill Publishing Co., Inc., 85 Westendstrasse, Frankfurt am Main
Switzerland.....M. R. Zeynel, McGraw-Hill Publishing Co., Inc., 2 Place du Port, Geneva
United Kingdom....Edwin Murphy, McGraw-Hill House, 95 Farringdon St., London, E. C. 4.

ANDERSON EXPANDERS OFFER NEW OPPORTUNITIES IN GRAIN EXPANSION



- The Anderson Expanding Process, where grains are cooked and expanded, offers new opportunities in two major fields. First, in the animal feeds industry, this process reduces the cost of animal production by increasing the assimilability of the grain, therefore, a shorter time required for animals to reach marketable weight. Second, in the human edible food field, this process produces cooked materials which are used as the basic ingredient of cereals, porridges and other edible dry foods.

The heart of this process, the Anderson Expander, is a vertical screw press which pre-cooks and expands materials in one continuous operation, providing greater production simplicity and lower costs. It converts starches in wheat, corn, rice, milo, chickpeas, etc. into uniformly tender, crisp, highly palatable products for the food and feeds industry.

Investigate grain expansion for your milling operation. Write for an Anderson Expander Bulletin giving complete details.

THE V. D. ANDERSON COMPANY

division of International Basic Economy Corporation

1962 West 96th Street *Cleveland 2, Ohio*

RESEARCH IN ACTION

At the Kreisinger Development Laboratory (above), one of eight C-E research laboratories, the time and talents of many experienced specialists are devoted to a single purpose—to find a better way. Their object—to enable Combustion to continue to provide the most reliable, the most efficient and the most economical steam generating and fuel burning equipment available anywhere.

At C-E, research activities range from studies of the nuclear characteristics of the atom and the chemistry of the molecule to the development of methods and materials, the test of metals and the operation of high pressure test boilers and nuclear reactor systems.

The results of C-E research in all areas of steam generation are reflected in the advanced designs of C-E equipment, whether purchased directly from Combustion or from any of its subsidiaries, licensees or representatives throughout the free world.

The picture shows part of the Kreisinger Development Laboratory at C-E's Chattanooga Division. The large structure shown at the rear of the building just left of center is a controlled-circulation test boiler capable of operating at 2000 lb per sq in pressure. At right center, the series of panels is a superheater simulator where the distribution, flow and pressure losses of a fluid may be determined under specified test conditions. Much work is performed here on fuels and their firing, and on the behavior of water, steam and flue gas in environments similar to those encountered in power plant practice.

associates, licensees and representatives throughout the free world

COMBUSTION ENGINEERING

Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y. C-280

All Types of Steam Generating, Fuel Burning and Related Equipment; Nuclear Reactors; Paper Mill Equipment; Pulverizers; Flash Drying Systems; Pressure Vessels; Soil Pipe

INTERNATIONAL MANAGEMENT'S

Recommended Reading

Establishing an Overseas Operation?

Management of International Operations, by Prof. John Fayerweather, discusses the problems faced by firms doing business in foreign countries. The book covers all major areas of management action—from human relations to financial policies. 600 pages, $9.50. (McGraw-Hill Book Co. Inc., 330 W. 42nd Street, New York 36, N.Y., U.S.A.) . . . Organizing for International Operations, by Alexander O. Stanley, analyzes the overseas organization of 30 leading U.S. firms, provides job descriptions of executives, case studies of operations. 318 pages, $12.00. (American Management Assn., 1515 Broadway, New York 36, N.Y., U.S.A.)

Establishing a Small Industry?

Small Industry: An International Annotated Bibliography lists more than 1100 books, articles, and pamphlets on every phase of small industry development—financing, industrial relations, policy and planning. 218 pages, $6.00. (The Free Press of Glencoe, 119 W. Lake Street, Chicago 1, Ill., U.S.A.)

Looking for a Phone Number?

The International Telephone Directory—published in English, French, German, and Spanish—lists the names, addresses, telephone numbers of nearly a half million firms throughout the world, plus reference data. 2,157 pages, $20.00. (Service Commercial et de Publicite, 25 rue Roque-de-Fillol, Puteaux-Paris, Seine, France.)

Keeping Up With Commodities

The 1960 Commodity Year Book provides data on the 100 basic world raw materials. Tables and charts show price movements, production, consumption. And there are facts about sources of supply, commodity uses, governmental activities. 385 pages, $14.45. (Commodity Research Bureau Inc., 82 Beaver St., New York 5, N.Y., U.S.A.)

The Latest on Latin America

Joint International Business Ventures in Brazil, by Jose Garrido Torres and Denio Nogueira, is an authoritative report on Brazil, and business operations there. $5.00. (Intl. Legal Research Dept., Columbia University, 116th St. & Broadway, New York, N.Y., U.S.A.) . . . How To Invest and Live In Mexico, by Daniel James, is an entertaining guidebook for those who plan to work—or just live—in Mexico. $5.95. (Nourse Publishing Co., P.O. Box 398, San Carlos, California, U.S.A.) . . . The 1960 South American Handbook, edited by Howell Davies, surveys Central America, Mexico, and Cuba —their histories, industries, culture, and education. $3.00. (Trade & Travel Publications Ltd., 14 Leadenhall St., London EC3, England.) . . . The 1960 West Indies & Caribbean Year Book does much the same for Bermuda, the Bahamas, Guianas, Central America, Venezuela, and Colombia. $11.00. (Thomas Skinner & Co. Ltd., 330 Gresham House, Old Broad Street, London EC2, England.) . . . For further information on Latin America, see page 16.

Will He Buy—or Not?

The Powerful Consumer, by Dr. George Katona, studies the attitudes and motivation of today's consumer and shows how these affect business trends. 276 pages, $6.50. (McGraw-Hill Book Co. Inc., 330 W. 42nd St., New York 36, N.Y., U.S.A.)

INTERNATIONAL
MANAGEMENT'S

Personal Business

Mutual Funds: They Are Here to Stay

There are good reasons for the popularity of mutual funds. These investment trusts offer a diversification of risk and a professional management that are beyond the means of most investors. And they have often proved to be profitable investments.

There are today a wide variety of funds to choose from. Many of the most popular funds have "balanced" portfolios: They keep, say, 65% of their assets in common shares, the rest in preferred stocks and bonds. You may prefer a fund that specializes. There are funds that concentrate on "growth" stocks, "income" stocks, or particular industries or areas. There are Canadian funds, European funds, and some with world-wide portfolios.

Be sure the fund you choose is suited to your needs. Beware of funds that do not make public their investment objectives and portfolio.

Most investments are "open-end"—they issue new shares to each investor, with the money added to the mutual fund. With exceptions, these are sold with a "load" charge to cover selling expense. A typical charge for one group of U.S. funds (The Vance Sanders Group): 7½% for under $25,000, scaling down to 2½% for $250,000 or over. Fundo Cresinco, in Brazil, scaled down to 3½% from 9%.

This load charge is added to the price, which is the current per-share asset value of the fund. The open-end funds stand ready to redeem shares at current net asset value (a few funds charge a small fee).

"Closed-end" funds are actually investment corporations backed by stock issue, whose objective is similar to a true mutual fund. A tip: Because of less "sales push" and publicity, closed-end trusts are often "bargains", selling below their net asset value.

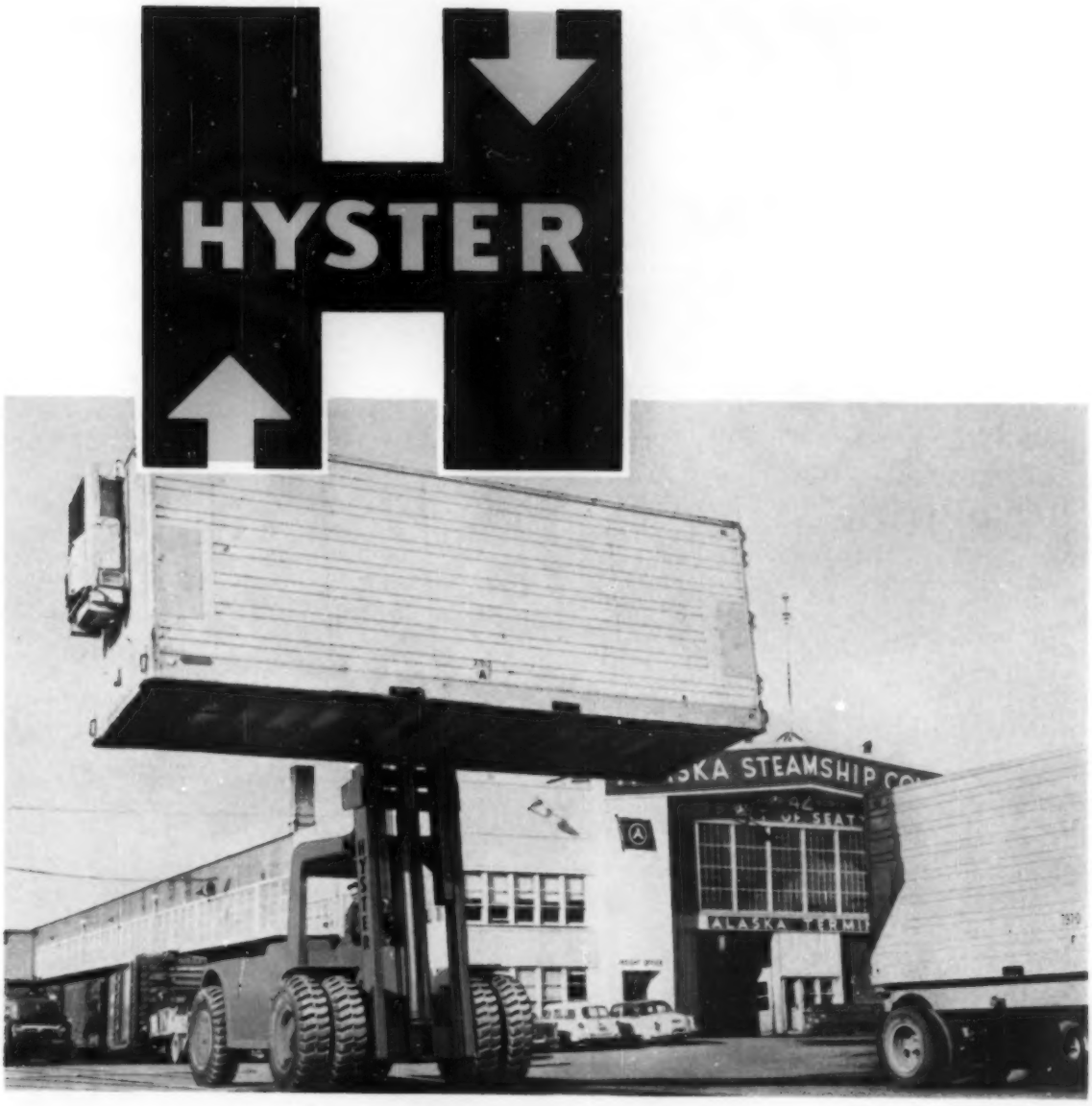
Some funds, such as Holland's Robeco, have mixed characteristics. Robeco is "open-ended" in that it issues new shares at net asset value (with no "load"). It is "closed-ended" in that it does not redeem shares.

Most mutual funds encourage shareholders to reinvest dividends. If you do not plan to reinvest, do not be misled by compounded figures.

You can buy many mutual fund shares through monthly or quarterly payments (the minimum is usually about $300 a year). Some plans are voluntary, others contractual. Under the latter, there is a penalty for canceling. Do not sign a contractual plan unless you know the reputation of the dealer or salesman.

A tip: If you plan to invest large sums regularly within a year's period, many funds will apply the lower "load" rate on the total.

You may wonder how much of your investment will be drained off by management fees. As a rule, fees average a fraction of 1% of the net asset value; for the holder of $4000 worth of U.S. funds, the fee will average about $20 a year. Administrative expenses average about the same. But you should be aware of the criticism that some funds pay exorbitant fees to their sponsors, or are used to "churn up" commissions for brokerage houses.



One man van handling—

HYSTER® has it!

Hyster Challenger 400 lift trucks make light work of handling heavy vans and cargo containers up to 40,000 lbs.

Power controls for safety and easy driveability.

Shortest turning radius plus precision inching and load control.

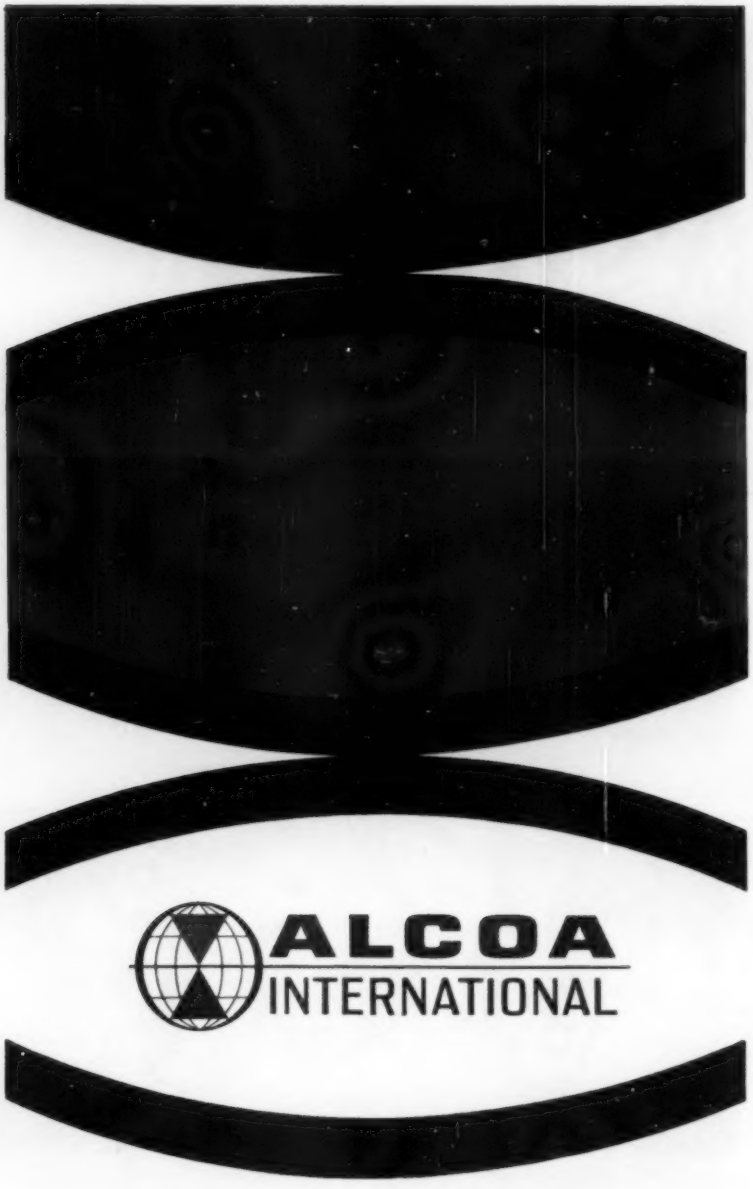
From 2,000 lbs. to 40,000 lbs. – Hyster has the truck you need.

Call your Hyster dealer, write for literature.

INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment

Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER COMPANY
INTERNATIONAL DIVISION
P. O. Box 328 • Peoria, Illinois, U. S. A.



Your link with Alcoa, world's leading producer of aluminium: Alcoa International ■ Through Alcoa International, the world's foremost aluminium research, development and production facilities are yours. Alcoa offers high-quality aluminium in a great diversity of shapes and forms and helps you to use it with technical assistance based on 72 years' experience. Call on Alcoa International, world-wide source for all products of Aluminum Company of America, or write Department 2089 . . .

ALCOA INTERNATIONAL, INC., 230 PARK AVENUE, NEW YORK 17, N. Y.

Subsidiary of Aluminum Company of America